

HEALTHCARE SYSTEM USING SUCCULENT PARTS OF PLANTS

(Volume I)



Dr. Shibabrata Pattanayak

HEALTHCARE SYSTEM USING SUCCULENT PARTS OF PLANTS

Volume I

[For infectious diseases]

Dr. Shibabrata Pattanayak

M.V.Sc. (Immunology, I.V.R.I.); Ph. D. (Pharmacology, W.B.U.H.S.)

**Healthcare system using
succulent parts of plants**
By
By Dr. Shibabrata Pattanayak

ISBN : 978-93-5346-842-2

©Published and Copyright hold by the author.

Composed by : Ajit Kumar Bhakat

Printed at:
Calcutta Block & Print
Sikdar Bagan St.
Kolkata - 700 004

Dedicated to:

***The devoted young generation
researchers***



PREFACE

This book is written as a research guideline for an alternative healthcare system, which can be brought into reality by the researchers of present time. After publication of some articles on the related topics, need of one organised book on that subject was felt. This book is an outcome of that feeling. As the book is written for the researchers, so the pattern of writing is like a review article, not like a text book. Detail description of many important analytical and testing procedures is not added in the book. These can be found in referred publications.

Ethnomedicine was not my subject at the early stage of my academic or service life, but it gradually becomes my centre of interest. The ethno-medicinal ideas described in this book and proposed pharmacological analysis for development of desired medicines requires further study in detail. The book is written to initiate the journey. Experts can comment on the proposals and the way of thinking and they are welcome to add modifications in all the sections of the proposed alternative healthcare system, but I am very much hopeful about widespread use of the proposed bio-medicines in future.

I admit that some portions of this book are taken directly from my previous publications. In many cases, these are added without alteration. For related detail information, original article may be checked.

I will consider all my efforts as fruitful if this book can motivate researchers to think and work on the subject.

Date: 16.01.2019

Thanking you,

Dr. Shibabrata Pattanayak

81/A, Mahatma Gandhi Road
Kolkata - 700 041

HEALTHCARE SYSTEM USING SUCCULENT PARTS OF PLANTS

Volume 1: For infectious diseases

Content

Section	Topic	Page
Chapter I	Establishment of disease inside the body	10
Chapter II	Development of Antimicrobial Resistance (AMR)	12
Chapter III	Modern medicine – some important limitations	14
Chapter IV	Other parallel systems	16
Chapter V	Herb based medicines	17
Chapter VI	Succulent bio-medicines	18
Chapter VII	Validation of traditional claims	20
Chapter VIII	Limitations of the contemporary systems used for validation of the claims	23
Chapter IX	Steps towards development of a drug	25
Chapter X	The gaps and the alternative ways	27
Chapter XI	Plants reported as having power to control diseases of infectious origin	29
Chapter XII	A comprehensive research proposal	31
Chapter XIII	Proposed design for production and transport of succulent Bio- medicines	34
Chapter XIV	The new horizon in treatment of untreatable diseases and establishment of export-oriented industries	36
Chapter XV	Tables	
	Table 1. Nutraceuticals, spices and other commonly used plant parts which may be used directly as medicine.	37
	Table 2. Plants with reported effects against diseases of infectious origin.	44
Chapter XVI	Bibliography	131
	Summary	145

Chapter I

Establishment of disease inside the body

Many protective barriers are working to protect every individual from the diseases. The skin, cilia of nose, different secretion and excretions like sweat, tear etc. are working as the external barriers. The internal barriers include primary barriers like gastric juices, detoxifying system of liver and excretory processes of urination and defecation etc. The cells of the immune system and their products, the actions and interactions performed by them are the main arms of protection of health by prevention of diseases. The endocrine system, excretory system, respiratory system and many other body systems work together to keep us healthy and free from any disease. Genetic make-up of individuals has a role behind all these factors.

Due to some reasons, sometimes one or more of these protective systems fail to perform their normal duties and we suffer from diseases. Basing on the causative factors, the diseases may be classified under two major categories.

1. Diseases of non-infectious origin, and
2. Diseases of infectious origin

1. Diseases of non-infectious origin: Lifestyle related diseases (improper lifestyle; improper intake of food and drinks; intake of adulterants and toxic chemicals; xenobiotic residues in food, effect of pollutants etc.), diseases with predisposed genetic condition and its stimulation by certain factors among individuals, diseases due to effects of different environmental factors, auto-immune diseases, diseases related with hypersensitivity, many cancers, diseases due to hormonal disbalance etc. can be categorised under that group.

2. Diseases of infectious origin: Diseases due to bacterial, viral, protozoan, parasitic etc. origin are generally categorised under this group.

No clear-cut demarcation is there between these two groups and diseases of one group may act as some predisposing factor for a disease of another group. Genetic make-up and lifestyle are two very important related factors for both type of diseases. Overall immunity

status is influenced by all these factors and at a low level of immunity status; a disease can establish itself easily inside the body.

Initiation of infectious diseases

Only entry of any microorganism inside the body can not initiate any disease among any individual. Establishment of a disease depends on many factors, among them individual resistance is very important. The example of Tuberculosis may explain the process.

Many people living in the area of poor hygienic conditions are already infected with *Mycobacterium tuberculosis*, but do not show any specific disease symptom in their lifetime. But in some persons, the disease progress and s/he become a patient of Tuberculosis. Such latent infection of Tuberculosis can express itself as a disease in the conditions like under nutrition [1] and low immunity status of the body [2]. It is due to the fact that, generally at malnourished or immuno- compromised condition of the body, that disease can actually establish and express itself. Expression of serious symptoms of Arsenicosis is also dependent on such nutrition factor of the individuals.

Conventional systems for prevention and treatment of diseases of infective origin

If we concise our discussion among the diseases of bacterial or viral origin, it can be said that use of protective vaccination by killed or live attenuated microorganisms is in practice and found effective against a few diseases. But for many other diseases of bacterial origin, use of antibiotics and some other antimicrobial agents is considered as the only way to kill or control the multiplication of infective microorganisms inside the body.

But due to some reasons, the ongoing system of use of antimicrobial substances to kill infective organisms to cure disease is facing a very tough challenge. Development of antimicrobial resistance (AMR) against these substances is the main factor working behind this.

Chapter II

Development of Antimicrobial Resistance (AMR)

Development of antibiotics – a self-limitating process

All the living entities of our planet are struggling continuously for their existence. Starting from the minute viruses, the fungus, bacteria, protozoa, parasites, plants and animals of various differentiated species are struggling for their existence and multiplication.

In the way of such struggle, as a part of evolution, microorganisms developed their system to secrete some antibacterial chemicals. Some of these chemicals are identified by the scientists and afterwards used as antibiotics [3].

Due to uncontrolled use of these chemicals to kill other microorganisms, the susceptible organisms get ample opportunity to alter their susceptible systems and to develop some new system to bypass the detrimental effect of those chemicals. It is called as microbial resistance to antibiotics [3].

Development of resistance among microorganisms against antimicrobial agents and spread of mainly plasmid based genetic materials related with such resistance to many other new species of microorganisms continuously with accelerated speed is becoming a threat for antimicrobial chemotherapy [4]. The spread is mainly due to indiscriminate, unnecessary use and residual effect of antibacterial substances [4]. Transport of such resistance power is performed by transport of related genetic materials from one microorganism to another. Resistance in bacterial population spread from person to person by bacteria, from bacterium to bacterium by plasmids, from plasmid to plasmid or chromosome by transposons [5]. The power of resistance is transmissible vertically among the same species and horizontally between other species of micro organisms [4]. That ultimately causes some very serious problems like development of Superbugs - organisms resistant to all available antibiotics [3]. This is perhaps becoming a dangerous threat to the modern civilization in near future.

Bacterial biofilm: a great danger

Not only the development of antimicrobial resistance, but some other microorganism related factors play many important roles during establishment of disease inside the body. Among them, bacterial biofilm formation is most important. Biofilm can be considered as an association of micro-organisms on a living or non-living surface within a matrix of extracellular polymeric substance produced by them [6]. Many species of bacteria can communicate with one another through quorum -sensing, a mechanism for co-ordination of gene expression during biofilm formation. Most of the microbial infections are associated with bacterial biofilms. Bacteria may remain less accessible to antibiotics and immune system of the body inside the biofilms and so that is having tremendous public health importance [6].

Present healthcare system: the source of Nosocomial Infections

In the present healthcare system, the patients with different diseases meet at the chamber of the Physicians, Nursing homes, Hospitals, Diagnostic centres etc. on regular basis. During their stay, a section of them leave many pathogenic microorganisms at these places. From the common toilets to the intensive care unit chambers, such organisms may spread. In these places, they get ample opportunities to meet other organisms to exchange genetic materials. This process continues and it is found that in spite of taking most modern protective provisions, many multi -antimicrobial resistant organisms are present in many of such places. These resistant organisms can infect any incoming patient suffering from some simple disease or even any normal person arrives there for any other purposes. So, people may be infected with such dangerous organisms from the area of healthcare facilities. Such infections are termed as Nosocomial Infections. These are commonly observed among children, aged persons, immune compromised persons and persons attended any surgery.

Chapter III

Modern medicine – some important limitations

Drug side effects and drug interactions

Concept of use of some pharmacologically active drugs is the main pillar of therapeutic regime of Modern Medicine. As the basic point of selection of a drug as medicine is its positive effect to side effect ratio, so there are definitely some side effects along with the effects for each of such medicines. It may be due to the reason that any drug act at least on one receptor system and no receptor system is present only in one part of the body. In most of the cases, all such receptors are working in more than one body system.

As a part of modern lifestyle, the allopathic medicines, pesticide residues in the food items, the adulterants and added chemicals in the name of artificial colour, flavour, stabilizing agent, emulsifying agent, chilling agent *etc.* as well as other toxic chemicals enter through different ways inside the body system of modern men are definitely acting together during causing any effect. The same detoxifying organs and excretory organs inside our body are struggling to clear them [7].

Thus, the people of the present time are accustomed with use of many 'drugs' together (knowingly or unknowingly) and so study on Adverse Drug Reactions, Drug-Drug interactions and overall Pharmaco-vigilance become so important now a days.

Molecular Pathological Epidemiology (MPE)

This concept covers the effects of different exogenous and endogenous factors working at different combinations to cause a disease in an individual [8]. Different diseases of neoplastic origin as well as non-neoplastic diseases like cardiovascular diseases, diabetes, obesity, adverse drug reactions, immunity related as well as diseases of infectious origin are covered for study in MPE [9]. As per the concept, each patient has unique pathologic processes resulting from cellular genomic, epigenomic, proteomic and metabolomic alterations, which are influenced by pharmacological, environmental, microbial, dietary and lifestyle factors [10]. MPE research has high relevance in disease prevention, because such studies have shown that different risk factors can influence different subtypes of one disease [11]. As per the theory, the transformation of population health science is integrated

with social, behavioural, economic, environmental and ecologic sciences along with basic biology and medicine [9].

From that point, it can be said that some aspects of MPE are controllable and another some aspects may not be easily controllable. Among that non-controllable section, genetics of individual is the main factor. For that section, specific therapy may be performed, if available.

The controllable section of MPE may be categorised in two parts.

1. Following of a model lifestyle and modification of existing lifestyle to prevent or control different diseases.
2. Prevention of diseases by ruling out the cause after taking precautionary measures and/or minimising the harmful effects of a disease by adding minimum or no stress to the body system.

Chapter IV

Other parallel systems

Systems other than Modern Medicine

The contemporary medicine system, commonly called as Allopathic or Modern Medicine, is the outcome of researches performed mainly in the laboratories of some western countries. As per the system, almost same type of drugs is used to cure diseases of human being and all other domestic or captive animals and birds. But before rapid development and spread of that system, there were several running systems of medicine to protect and cure man and animals from various ailments.

Most of those old systems are still continued among some small sections of people. These systems are continued without any research and without any effort to update them as per the need of the people of the changed societies. Perhaps a good portion of knowledge base of some of these systems is lost forever due to these reasons. So, these systems are not considered as efficient enough to compete with the Modern medicines by many people now a days.

But disease pattern changes along with change of time. As a consequence of huge use and dependence on the Modern medicines, which are mainly of synthetic origin, some new kinds of ailment developed. The medicines are also losing their efficacy in many cases. Lifestyle of the modern people is also changed in such a way that a re-thinking on use of the forgotten old medicines, mainly of natural origin, has started.

Chapter V

Herb based medicines

The plant resources

Plants are used as a therapeutic mean from an ancient time. Among 2,50,000 higher plant species on earth, more than 80,000 are having medicinal value [12]. Leave, bark, seed, seed coat, flower, root, pulps etc. of different plants are considered as reservoirs of naturally occurring chemical compounds and of structurally diverse bioactive molecules. Industry directly can use these molecules or can use them as lead molecules to synthesize more potent molecules [13].

There were some alternative healthcare and treatment systems available before the establishment of Modern medicine. Formal codified systems like Ayurveda, Siddha, Unany-Tibb etc. are among them. Ayurveda is the most potent and famous among these. In that system, mainly different dry parts of the medicinal plants are mixed together in some vehicle as per Ayurvedic formulations to use them as medicine. Another system, Homoeopathy, is also in practice from a long back. In this system, generally the alcoholic extracts of dry parts of the medicinal plants are further diluted to use them as medicine as per the standard formulations.

Along with these established systems, one informal system evolved over thousands of years through experiences and carried from one generation to the next. The ethnic and rural people use plants available in their locality for medicinal purposes. In almost all such ethno-medicinal practices, plant parts were used as such [14].

The ‘ineffective’ medicinal plants – are they really ineffective?

In almost all studies related with validation of the traditional or reported medicinal use of plants, different solvents (Methanol, Ethanol, Acetone etc.) are used to extract out some ‘principles’ from the dry part of the plant. These are then tested for their reported efficacy. Then efforts are made to identify the active principles from the solvent extracted parts to prepare them in the laboratory to market them as medicine after following standard studies for dose, toxicity etc.

But it has been argued that the efficacy of the solvent extracted part or the separated active principles cannot show or represent the total effect of the plant part, as many of the principles become lost during the whole process [15]. Validation of reported medicinal plants at their fresh, succulent form with all the available principles within them have been proposed with study of toxicity, dose etc. before use them directly as medicine [14].

Chapter VI

Succulent bio-medicines

Use of succulent parts of plants as medicine - a new idea

Plants are supplying food to us. They contain several nutrients like Carbohydrate, Protein, Fat, Minerals, Vitamins etc. All of these help us in healthy living. Apart from these, they develop various chemical compounds inside them for their own purposes. These compounds can be used for our purposes also, if properly studied. Such studies are going on throughout the world and some isolated compounds are used as very good medicines under the umbrella of Modern medicine. But it is just a very minute achievement in comparison to the immense potentiality of the plants to supply us efficient medicines.

Use of succulent parts of medicinal plants

The potential parts of the medicinal plants can be used as such just after collection. The people residing at the rural areas are accustomed with the uses of such readily available herbal medicines mainly at their raw, pure, fresh as well as crude form. These are used mainly at succulent stage and at dry stage in some cases. These medicines are developed through the gathered experience of people for generations [16].

In one recent article, a comprehensive research proposal for a study on the medicinal plants having possible potentiality to act as an alternative to the use of synthetic antimicrobial substances to control diseases of infective origin with a detailed guideline for production, storage and global transport of succulent bio-medicines has been outlined [17].

Source of succulent medicines

A. Succulent nutraceuticals

Not only synthesis of the chemicals capable of acting directly as medicines, but plants also develop many other types of phytoconstituents which can protect us indirectly from infection of pathogenic microbes. Effective use of plant derived medicines and nutraceuticals as well as changes in the lifestyle may influence molecular pathological epidemiology of populations and so can deeply influence the establishment of different diseases [17].

As the nutraceuticals are well tolerated in our body system, so chance of toxicity during

their medicinal use is expected to be very less. In many cases, these nutraceuticals are not getting any chance to influence positively our body system due the factors like non-inclusion of them in our diet or their modification during preparation of food from them. As for example, many people of younger generations do not like to add salads or fruits in their diet. On the other hand, due to boiling at high temperature or due to addition of some toxic chemicals as preservatives etc. with their juices or pickles, many such items lose their actual efficacy.

In Table 1, a list of some plants commonly available and used as nutraceuticals are added. These can be used as some effective medicines after performing a small-scale study.

B. Succulent Vegetables, Fruits and Spices

The fruits, vegetables, spices etc. can also be used as medicines. Some fruits are already used as preventive medicines, knowingly or unknowingly. Many other fruits are there, which are either considered as some vegetables or not considered as essential. But many of these have the potentiality to act as effective preventive or curative medicines. During processing or cooking of fruits and vegetables at high temperatures, many important phytochemicals become lost or reduced in quantity. Many of such phytochemicals are already known as very important to our health, and effect of many minute others are unknown to us. These fruits and vegetables may be used as medicine after extraction of juices from them (as such or at a concentrated form).

So, all the phytochemicals of the concerned part of the medicinal plants will be available in the juices and cut pieces and will act after entering inside our body. The seeds and other dry parts may be used as dry powder or may be used as such. These can be decided as per the research reports. Some of such plants are listed in Table 1.

C. Other succulent medicines for systematic use

The fruits, nutraceuticals, spices etc. are expected to act without showing any harmful effect inside our body. So, the possibility of toxicity is less among such medicines. But for the other plants having report for systematic use, detail study for effectivity and toxicity is very important.

Various plants are reported for their use against various diseases of infectious origin by different communities of the world. These plants are listed in Table 2.

Chapter VII

Validation of traditional claims

Contemporary systems used for validation of efficacy of medicinal plants and trial for drug development

There are many reports and claims regarding protection and/ or cure of many diseases by use of parts of various medicinal plants. To validate such traditional claims, contemporary analytical systems are generally used with a target to identify active principle/s from the reported medicinal plants.

Biologically active compounds present in plants are termed as phytochemicals. Phytoconstituent extraction involves separation of the medicinally active principles from plant parts using selective solvents [18]. Most of the pharmacological reports of plant/ plant extracts screen the organic soluble extracts of the dried plant parts [19]. Research for identification of active principles from medicinal plants follows some common steps. Validation of the reported medicinal use of plant is performed as a first and deciding step for further research [14]. Generally, the plant parts are collected, dried and preserved. Then methanolic, ethanolic, acetone, aqueous etc. extracts of the preserved plant parts are made and stored at different manners. Then these are tested for their reported medicinal use by different *in vitro* techniques and/or through *in vivo* models, either in that form or in semi-purified or purified form or after identification of active principles [15].

Ethnomedicinal use of a plant is generally not confined only in a single purpose. As stated earlier, effect of good immunity status and nutritional status of individuals can greatly influence both the process of disease initiation as well as efficacy of the medicines. Oxidative stress is thought to contribute in the way of development of many diseases directly or indirectly [20, 21]. So, validation of traditional claims should target the study of anti-microbial, anti-oxidant and immunostimulant activities of the plants.

Phytochemical extraction, purification, characterisation and drug development involve many complex steps. Some common analytical systems and procedures related with validation of traditional claims and development of plant derived drugs are stated briefly.

A. Extraction of plant materials from dry plant parts by different solvents

It is the first step of phyto-analytical study.

Solvents: Different solvents are used to extract the bioactive compounds from plant

materials. For extraction of hydrophilic compounds, polar solvents such as methanol, ethanol, ethyl acetate etc. are used. For extraction of lipophilic compounds, dichloromethane or a mixture of dichloromethane and methanol in ratio of 1:1 is also used. Hexane is used sometimes to remove chlorophyll [22].

Methods: Various methods like sonification, heating under reflux, Soxhlet extraction etc. are commonly recommended by Pharmacopeia of different countries. Other modern extraction techniques like solid-phase micro-extraction, supercritical-fluid extraction, pressurized-liquid extraction, microwave-assisted extraction, surfactant-mediated techniques etc. are also used [23].

B. Validation of traditional claims by *in vitro* study

The tests related with validation of claims are mostly performed on the solvent extracted materials of dry plant parts. In some specified requirements, the purified materials are also tested for their efficacy.

1. *In vitro* antimicrobial efficacy study

For *in vitro* validation of traditional claims of antimicrobial efficacy of any plant part, generally the direct antimicrobial efficacy is tested following some standardized methods, like

- i) Diffusion methods (Agar disk diffusion method, Antimicrobial gradient method, Agar well diffusion method, Agar plug diffusion method, Cross streak method etc.).
- ii) Thin layer chromatography (TLC), Bio-autography (Agar diffusion, Direct bio-autography, Agar overlay bioassay etc.).
- iii) Dilution methods (Broth dilution method, Agar dilution method)
- iv) Time kill test by Time kill curve
- v) ATP bioluminescence assay
- vi) Flow cytofluorometric method [24] etc.

Recently, spectrophotometric evaluations of direct bacteriostatic action of plant derived materials are tried [25]. In almost all these tests, direct antimicrobial efficacy (hampering of microbial multiplication or direct killing of microorganisms) is evaluated.

2. Anti-oxidant property study

By oxidation, free radicals are produced in the body which are detrimental to health. Antioxidants act against that process. Antioxidants are either produced inside the body system or achieved from food. Many fruits, vegetables and plant parts are having such antioxidants.

The antioxidant activity is measured by some standardized methods like

- i) 2, 2-Diphenyl-1-picrylhydrazyl (DPPH) assay
- ii) Folin-Ciocalteu method
- iii) Xanthine oxidase inhibition assay
- iv) Griess- Ilosvay method [26] etc.

3. Study for immune-stimulation activity

Immunostimulants can stimulate the body protective mechanisms in different ways. The vaccines and entry of any foreign antigen inside the body can cause specific immunostimulation. The plant materials may act as non-specific immunostimulant. Different methods are developed for study of both cellular and humoral immunity.

- i) Study of increase in anti-hemagglutinating antibody (HA) titre for study of humoral immunity,
- ii) Counting of plaque forming cells (PFC) for study of humoral immunity,
- iii) Macrophage migration index (MMI) for study of cellular immunity [27]
- iv) Study of *in vitro* phagocytosis of *Candida albicans* spores by neutrophils taken from blood for phagocytosis power determination (cellular immunity) [28]
- v) Assay of phagocytic activity of blood by microscopical study (cellular immunity)
- vi) Nitro blue tetrazolium chloride (NBT) Assay (cellular immunity)
- vii) Serum lysozyme activity study (innate immune system) [29] etc.

Chapter VIII

Limitations of the contemporary systems used for validation of the claims

Quinine, Digitalis, Neostigmine, Codeine, Artemisinin etc. are some of the plant derived active principles used effectively in Modern medicine. But another huge number of phytochemicals are identified from various plants and valued only as some research data for their inability to pass the related procedures to establish themselves as some effective medicines.

Many questions are raised against the conventional pattern of validation of traditional claims of a plant part with a report of disease protective or curative property/ies. It is said that only the solvent extracted part/s cannot represent the total effects of any medicinal plant [15].

It was found in an experiment that the semisolid methanolic extract of a plant part fail to produce any antimicrobial efficacy against microorganisms when diluted in water instead of methanol, though it was effective when diluted in methanol [25]. So, even the change of the diluent can affect the efficacy of the extracted plant materials in laboratory.

It is argued that the plant medicines may act in such a way that it cannot be detected by the contemporary analytical system and the solvent extracted part or the separated active principles may not show the total effect of the plant part due to loss of many of the principles during the whole process [14]. On the other hand, one plant may act by using more than one physiological system and so may perform a complex type of action inside the body as reveals from the ethnomedicinal reports (Table 1 and Table 2). Some new metabolite/s of the plant parts may also develop inside the human/animal body to cause some important effect/s. So, the effect of use of plant parts, particularly when used internally directly as medicine on a complex system like human body, cannot be totally evaluated easily in artificial laboratory conditions and in animal or other model-based experiments applying the presently available scientific knowledge and tools.

In almost all the ancient civilizations, plant parts were used as such. In many cases, the plant parts were used at their succulent stage, just after collection from the living plant. Generally, the ethnic and other rural people traditionally use the plants in their crude, succulent and fresh form in most of the time [14].

Even in the presently practiced Ayurveda system of medicine, the dry plant parts and their different formulations are generally used. Only the solvent extracted parts or active principles may not show the total effect of such formulated medicines.

So, it may not be a wise decision of the scientific community to consider the contemporary system of validation of efficacy and drug development as the only and ultimate way to get effective medicines from the plant source. A special type of technique may be developed where validation of reported use of parts of medicinal plants at their original useable form on animal models may be performed at first. Then validation of reported dose and afterwards all other studies (toxicity study, identification of phytochemicals etc.) may be performed.

Chapter IX

Steps towards development of a drug

Identification of phytochemicals

Different analytical procedures are applied generally on the solvent extracted materials of dry plant parts to identify the available phytochemicals. Different procedures are followed by the researchers for that purpose. Some examples are stated below.

1. Purification

A number of chromatographic techniques such as HPLC (High Performance Liquid Chromatography), TLC (Thin Layer Chromatography), HPTLC (High Performance Thin Layer Chromatography), OPLC (Optimum Performance Laminar Chromatography), GC (Gas Chromatography), PC (Paper Chromatography), CC (Column Chromatography) [13] and non-chromatographic techniques such as immunoassay with use of monoclonal antibodies, phytochemical screening assay, Fourier-transform infrared spectroscopy (FTIR) [23] etc. are used for purification of the bioactive compounds.

Due to the fact that the plant extracts usually occur as a combination of various types of bioactive compounds or phytochemicals with different polarities, their separation still remains a big challenge for the process of identification and characterization of bioactive compounds [23].

2. Structure elucidation of the purified/ semi purified compounds

This step is performed by different standardized techniques like Fourier Transform Infra-Red spectroscopy (FTIR), Nuclear Magnetic Resonance (NMR), Mass Spectrometry (MS) etc. [13].

3. Biochemical characterization of purified/ semi purified compounds

This is a multi-facet step which includes Toxicity assay, *In vivo* evaluation of efficacy and multistep Clinical Study [23].

i) Toxicity study

For toxicity study of all types of chemicals, the most common practice is to follow the guidelines set by the Organisation for Economic Co-operation and Development (OECD). It has five sections (Physical and chemical properties, Effects on biotic systems, Degradation

and accumulation, Health effects, Other test guidelines) [30]. Many other toxicity study methods are also developed and followed according to the requirements.

ii) *In vivo* study

Various tests are standardized with different tissues, blood and other body fluids of living entities for such type of study. In many cases, laboratory animals are also used. In many *in vivo* studies, the laboratory animals are specially designed for use in specific purposes. Activity of some system or organ of the selected laboratory animals is kept temporary or permanently suppressed or stimulated purposefully with the help of surgery, specific medication or by use of various devices. Mice, Rat, Guinea pig and Rabbit are the commonly used animals for that purpose.

iii) Clinical trial

The final step of drug development is clinical trial. This step is rather complex and performed phase after phase. More or less a drug has to pass a) Preclinical trial, b) Phase I trial, c) Phase II trial, d) Phase III trial and e) Phase IV trial [31].

Chapter X

The gaps and the alternative ways

Many gaps can be identified inside the ongoing procedure of validation of traditional claims and development of medicine from the plant sources. As an example, the antimicrobial efficacy study can be analysed.

Validation of reported antimicrobial efficacy of plants (direct or indirect): requirement of thorough research

As stated earlier, only after effectively crossing the protective barriers, a microbial infection can cause a disease in any human or animal body. Apart from the direct barriers, indirect barriers like body immunity status, nutrition status, lifestyle, living environment, age, prevalence of other immunosuppressive disease/conditions, genetic make-up etc. play many important roles. Perhaps due to this, in Homoeopathy system of therapy, patients are given more importance than the disease symptoms. In Ayurveda system of medicine also, balance of three types of 'body fluid' (Rasa, pitta and Kafa) are considered as main parameters for establishment of a disease. Various internal factors are given importance in many other systems also.

The minute micro-organisms are struggling against attack of other groups of microorganisms and so developed some tools for their protection inside them. These tools are identified and chemically synthesized by us to use as some weapons to kill pathogenic micro-organisms in the name of 'Antibiotics'. Like all other living entities of the globe, plants are also struggling for their existence and multiplication. To protect themselves from the infection of the soil and other environmental microorganisms, plants also developed some ways and means [3]. Those may differ from plant to plant, but are expected. So, like all other phytochemicals, the antimicrobial phytochemicals are also developed in various species of plants as a part of evolutionary outcome of the struggle for their existence [3]. The mechanism of action of such plant derived antimicrobial substances may be rather complex and different than those of antibiotics. Some of such phytochemicals may not have any antimicrobial efficacy, but their metabolites may have. As the system of living of

plants are more complex than the microbes, so it may be assumed that development of fighting weapons against the infecting microbes are also far more diverse and complex among plants in comparison to the antibiotic producing microorganisms. So, acting of many antimicrobial weapons together may be the actual basis for fighting against invading microbes in plants. All these weapons may not be available at detectable amounts in dry plant part extracts. So, only evaluation of some solvent extracted portion and identification of active principles from plant parts to validate traditional claims and to achieve plant derived medicines may not be considered as a sufficient or fool proof concept. As the living plants are actively engaged in many such operations continuously, importance of study of plant materials just after collection from the living plants cannot be ignored.

There are some other important considerations also. Plants also develop many other types of Phyto-constituents which can protect us indirectly from the infection of pathogenic microbes. This point demands further study in detail.

So, desired changes in the lifestyle and effective use of plant derived medicines may influence molecular pathological epidemiology of populations and so can deeply influence the establishment of different diseases.

Chapter XI

Plants reported as having power to control diseases of infectious origin

Identification of plants with reported use as antimicrobial and other related purposes

The traditional use of parts of various plants in medicinal purposes was practiced throughout the globe before development of the Modern medicine. The knowledge was gathered perhaps through cumulative experience of trial and error, instinct or insight or by such other practices of some specific category of people for generations. The documented knowledge of various sources is scrutinized thoroughly and lists of such plants with possible anti-microbial efficacy has been prepared (Table 1 and Table 2).

In Table 1, the plants and the plant parts locally available in West Bengal, India are added with other reported uses. The plants listed in this table are used as nutraceuticals, vegetables, fruits, spices or are used commonly in medicinal purposes.

In Table 2, name of other medicinal plants is listed with their reported use. The native habitat or distribution of the plants is attached to get some idea about the best climate for their cultivation. However, in most of the cases, the plants are naturalized in many other countries and adapted in many other related climates also.

Some previous workers have enlisted the plants available and used in their localities or countries in the purposes like skin affections [32, 33, 34], wound healing and other related activities [35,16] etc. In some other sources, many important medicinal uses of plants are described along with such effects [36, 37]. The list may be increased, as preparation of an exhaustive list of plants used in such practices may require country wise involvement of researchers.

In the tables, the plants with antimicrobial and related activities are listed for validation of the traditional and/ or reported claims with a target to get effective bio-medicines from them.

Traditional uses of the plant parts are described in different manners by different authors. Moreover, the described purposes related with the use of any plant part/s are not always at

per with the description style of Modern medicine. Some broad areas are covered by the used terminologies in most of the cases, instead of showing specific problem/s or disease. A variety of diseases may be covered with such terminologies (chest affections, urinary affections etc.).

Some plants are reported for their efficacy to excrete accumulated toxins from the body (as *Paederia foetida* L.) or acting as diuretic (*Tribulus alatus* Delille. *Terminalia catappa* L., *Veronica beccabunga* L. etc.). Such type of efficacy may also add some extra power to the body system to resist many types of diseases. Some plants with previous report of containing important nutrients, vitamins, minerals etc. without any report of medicinal use are possibly not enlisted, though those may play many important roles in maintaining overall immunity by influencing protective power of the body against different diseases.

It was noticed during collection of information that more than one part of a medicinal plant is used in more than one medicinal purpose in many cases. As the present work is related with enlisting of medicinal plants reported to have activities related with any direct or assisting action in controlling of the diseases of infectious origin, the other uses of the plants or plant parts are omitted. Though many parts of the reported plants are used in many medicinal purposes and form of use are also many (succulent extract, decoction, juice, oils, watery extract, direct cut pieces of plant parts etc.), only related reported uses are included and procedures of preparation, doses etc. are omitted as it is not available for many plants in the sources.

The listed plants may have some important activities as per their reported use, like

- i) Direct anti-bacterial, anti-viral, anti-fungal actions etc.
- ii) Overall immunostimulant and/or antioxidative actions,
- iii) Power to protect and /or restore functions of a body system/s by supporting the system/s,
- iv) Stimulation of fighting efficacy of the body system/s during disease by detoxification and excretion of toxins etc.
- v) Efficacy to bring symptomatic relief/reduction of severity of any devastating disease by direct or indirect means etc.

As the reported uses of the medicinal plant parts are broad and multi-functional, some other means of treatment of some other non-infective diseases may also be identified and developed as outcome of an elaborate research on them.

Chapter XII

A comprehensive research proposal

In addition to the contemporary pattern of research performed for validation of traditional claims and reportings and searching of active principles for use as some effective medicine, study of the plant parts having report of hampering establishment and/or spread of any disease of infective origin inside the body may also be started. As most of the medicinal plants of the list are having report for use in more than one purpose and many plants are used in almost same purposes, a detail correlated study may be far more beneficial than the study with a single direction.

Proposed steps to study the listed plants

1. Arrangement of total study facilities near the plant resource

i) It can be performed either by establishing laboratory and other related facilities a) near the native place of the study plant/s with assurance of supply of sufficient materials at succulent stage within a very stipulated time, or b) after making arrangement for cultivation of the plant/s near the laboratory facilities in an environment (soil, climate etc.) almost natural to its native place. Seasonal availability of study plant/s or plant parts has to be considered during planning. It is found that in many cases, soil and climate have effects on the quantity and quality of phytochemicals of plants and these are also variable between cultivated and wild plants. So, standardization of quantity and/or quality of phytochemicals in the available plant/s of the area is also very much important. Developmental stage of the plants may have some relationship with their use in many cases. Only the cultivated plants may be used for study purpose and the naturally growing (wild) plants may be left to keep ecological balance intact.

The so-called vegetables, fruits, spices or other plants considered for study or production of succulent bio-medicine should preferably be cultivated under organic farming, avoiding chemical pesticides and fertilizers.

ii) Green house may be arranged in the areas of cooler climate for cultivation of the plants of tarried zones. Proper shed with air cooling or conditioning facilities may be arranged for the reverse requirement.

2. Collection of plant materials for study

The plant materials may be collected for study in the already standardized laboratories. Planning for study of all the different available parts of the study plants at succulent stage as well as solvent extracted portion of dry parts may be performed, without considering the report of use of a particular part of the plants in traditional claims or literature sources.

3.Special study of succulent plant materials

The freshly collected succulent materials may be processed further for

- i) Study of effect of storage on efficacy of plant parts/materials maintained at different freezing conditions (at different freezing temperatures).
- ii) Study of efficacy of the succulent stem, root, leaf, seed etc. as well as their juice, latex, decoction etc. directly *in vitro* and *in vivo* systems as per logical decision for all the related effects (direct antimicrobial, immunostimulant, anti-oxidant, local effects etc.).
- iii) Air drying/shade drying of the plants as per standard methods.
- iv) Extraction of plant materials from the dry plant parts by using different solvents as per standard methods.
- v) Study of efficacy of solvent extracted plant materials by *in vitro* studies or by other study models as per logical decision.
- vi) Study for identification of phytochemicals by Purification and Structure Elucidation may be performed following standard methods.
- vii) Biochemical characterization of all the succulent plant parts, solvent extracts of the dry plant parts as well as the identified active principles may be arranged after logical modification of the existing procedures of toxicity study, *in vivo* study and clinical trials.
- viii) Study on combinational use of more than one active principle of the same plant or other plants with logical selection may be performed.
- ix) Study of use of succulent plant part of more than one plant or their juices and also use of dry plant parts or their extracts in different logical combinations may be performed.
- x) The extracted juices of succulent parts or the solvent extracts of dry parts may be made more concentrated by using technologies like evaporation, heating or cooling or may be diluted further for therapeutic purposes as per study reports. Study should also be performed to detect any loss of phytochemicals during performing such procedures.
- xi) The dry seeds, spices etc. may be used directly as medicine after preparing powder and keeping in some capsules or preparing tablets or any other procedure as per the study reports.
- x) For searching of direct antimicrobial effects, antimicrobial study of all the materials

(juices collected from different succulent plant parts by pressure, decoctions and other reported forms, different solvent extracts, aqueous extracts etc. of dry plant parts as well as the active principles) may be performed primarily. It can be performed on many microorganisms, but some model microorganisms may be selected for that purpose. From the positive results, further studies may be performed against selected resistant bacterial strains. Study for possible immunomodulation, antioxidant action etc. may be performed following standard methods with logical modifications, if required.

As information about phytochemicals (active principles) of many plants is already known, those can be listed after verification. The study reports may be matched with the study report of at least other two laboratories working in the same manner before accepting them.

A complete data base may be prepared for each reported medicinal plant/claim.

This data base may lead towards efficacious use of plant derived medicines in the intended purposes.

Chapter XIII

Proposed design for production and transport of succulent Bio-medicines

Preparation and transport

Many active principles or their structural analogues are already in use in Modern medicine. The systems for their use as effective medicines are already standardised.

For the succulent bio-medicines, some low-cost techniques like dosing in small aliquots, storing at some low temperatures (0 °C, - 10 °C, - 20 °C etc.) or freeze drying as per requirement and research reports can be employed for that purpose [14].

As the biological materials are vulnerable to easy decomposition, maintenance of sterility during production, storage and transport is very much important. Maintenance of proper temperature during packaging and transport (cold chain) may play a crucial role on keeping the quality of these bio-medicines intact. Checking of the quality is also required before use by the patients. Different indicator chemicals are available for use on the vials or packets, such as Vaccine Vial Monitors used during transport of thermolabile vaccines, may also be used in that purpose also.

Packaging

These medicines may be packed in single dose disposable ampoules to use them at liquid stage after reconstitution by increasing the temperature near the body temperature (37°C).

Another option is to use these medicines at encapsulated form. The liquid medicines may be packed by Single-Piece gel encapsulation and the powdered medicines in Two-Piece gel encapsulation. These can be brought to body temperature before use.

Capsular material for dosing of medicines

Single-Piece gel encapsulation (“Soft capsules”)

In Modern medicine, these soft-shelled capsules are used for oils and for active ingredients that are dissolved or suspended in oil.

Like many Modern medicines, Soft gels can be used as an effective delivery system for oral drugs, especially poorly soluble drugs. This is because the fill can contain liquid ingredients that help increase solubility or permeability of the drug across the membranes in the body.

Two-piece gel encapsulation (“Hard capsules”)

Hard-shelled capsules may be used to contain dry, powdered ingredients or miniature pellets made by any medicine. The powder or spheroids inside the capsule may be some active ingredient or any other dry/ semisolid medicine.

Capsular materials

There are many capsular materials, both from animal and vegetable origin. Carbohydrate polymers, starch and its derivatives, cellulose and its derivatives, plant exudates and extracts, extracts from marine origin, microbial and animal polysaccharides, gluten, milk and other proteins, gelatine, different lipids, fatty acids and fatty alcohols, glycerides, waxes like beeswax, carnauba wax, candelilla wax; phospholipids (liposomes), polyvinylpyrrolidone (PVP), paraffin, shellac and different inorganic materials etc. are among them. Many derivatives are there under each type and from these, the proper capsular material can be selected as per requirement after safety study [38].

The most commonly used capsular materials are as follows

Animal source

Gelatine: Gelatin capsular material, informally called gel caps, are composed of gelatin manufactured from the collagen of animal skin or bone.

Vegetable source

Commonly used capsular materials obtained from vegetable source are of two types.

Hypromellose: a polymer formulated from cellulose.

Pullulan: a polysaccharide polymer produced from tapioca starch [39].

Encapsulation process

The process of encapsulation of hard capsules can be done on manual, semi-automatic and automatic capsule filling machines. Soft capsulation can be performed during production of the liquid medicines or afterwards. The available technologies may be modified to some extent to serve the specific purposes [39].

Chapter XIV

The new horizon in treatment of untreatable diseases and establishment of export-oriented industries

Horizon of a new type of phytomedicine based treatment of infective diseases

During last a few decades, a huge amount of fund was regularly invested in continuous searching of new antibiotics and other chemo therapeutic agents to fight against diseases of infective origin. But during last a few years, it is found that the newly developed antimicrobial drugs are becoming ineffective quickly due to rapid spread of different resistance bearing plasmid bound genetic materials among microorganisms. Even the antimicrobials kept as some stock for emergency use are also found ineffective in many cases. Many organisms are already found resistant to those antibiotics without facing them anytime. So, the investors are losing interest to invest for development of new antimicrobial drugs for not getting expected profit.

So, continuous development of new antimicrobial agents may not solve the present trend of losing of efficacy of the antimicrobial drugs. The plant derived antimicrobial agents may work through different pathways than commonly used antibiotics and chemotherapeutic agents and thus may be an additional or alternative way to combat the problem [25]. Same type of effects may be identified among many plant-derived medicines against the bacterial biofilms also.

Establishment of export-oriented industries

The countries having huge resources of natural plants are definitely having huge resources of medicinally active plants. The validated succulent plant part extracts of those medicinal plants having any action against diseases of infective origin, direct or indirect, may be utilized for creation of many export oriented agro-medicine industries. The countries of the torrid zone of the globe are blessed with such plant resources. After proper study, the succulent plant part extracts, cut pieces, dry powders, green parts, latex, pasty materials etc. having desired efficacy (at local or systemic uses) may be exported with proper packaging for herb - based treatment throughout the globe as an effective alternative of Modern medicine.

So, a new journey can be started with new tools for treatment of diseases of infective origin by some alternatives along with creation of many cheap, export oriented and labor involving industries in the countries with such plant resources.

Chapter XV

TABLES

Table 1. Nutraceuticals, spices and other commonly used plant parts which may be used directly as medicine.

Name of the plant with Family	Common name	Reported use	Local use and observation
Vegetables, fruits and other Nutraceuticals			
<i>Aegle marmelos</i> (L.) Corrêa Rutaceae	B: Bail H: Bel E: Bengal quince	Plant antibacterial [36, 40]	Pulp of ripe fruit in habitual constipation
<i>Cajanus indicus</i> Speng. Fabaceae	B: Arahar H: Arahar E: Pigeon Pea	Leaf juice in jaundice, cough, haemorrhoids, stomatitis; leaf and root juice in diabetes [41]	Juice of succulent leaves fed in jaundice
<i>Centella asiatica</i> (L.) Urb. Apiaceae	B: Thankuni H: Mandukaparni E: Indian Pennywort	Leaf tonic and diuretic, used in Leprosy [37]; in wounds and acne [42]	Fed to weak children
<i>Citrus limon</i> (L.) Burm. Rutaceae	B: Lebu H: Nebu E: Lemon	Anti-cancer, prevent kidney stone, balance body acid-base balance [43]	As immunostimulant during acute stage and after recovery from disease
<i>Daucus carota</i> L. /Subsp. sativus Apiaceae	B: Gajar H: Gajor E: Carrot	Root diuretic, stimulant [37]; extract in Leprosy [44]	As immunostimulant, can stimulate hair growth and wound healing of rabbit
<i>Emblica officinalis</i> Gaertn. Phyllanthaceae	B: Amlaki H: Amla E: Indian gooseberry	Antiseptic [45]; immunostimulant [46]; antimicrobial [40]; fruit juice in septic fever and leucorrhoea [41]	Succulent fruit as immunostimulant and during recovery from chronic diseases

Contd...

Name of the plant with Family	Common name	Reported use	Local use and observation
<i>Enhydra fluctuans</i> Lour. Asteraceae	B: Helancha H: Helancha E: Buffalo Spinach	Cutaneous and nervous affections [37]; in inflammation, skin diseases, laxative, bronchitis, nervous affection, leukoderma, biliousness, in Small pox; as antioxidant, hepato-protective, CNS depressant, analgesic and antidiarrheal [166]	Extract of succulent leaves and stems applied on head one hour before bathe in sinusitis
<i>Ipomoea reptans</i> (L) Poir. Convolvulaceae	B: Kalmi H: Kalmi Shak E: Water Spinach	Leaf for protection from Chicken Pox, Gonorrhoea: root and stem paste on immature abscess [41]	As immunostimulant in herbivores
<i>Lagenaria vulgaris</i> Ser. Cucurbitaceae	B: Lau H: Lauki E: Bottle Gourd	Fruit juice externally in Pyorrhoea and different skin diseases, internally in chronic acidity and pyrexia with vomiting tendency [41]	Protection from skin diseases and chronic digestive problems
<i>Mentha longifolia</i> (L.) Huds. Lamiaceae	B: Pudina H: Pudina E: Mint	Leaf antiseptic, stimulant, fever [37]	Succulent leaf extracts in chronic digestive problems
<i>Momordica charantia</i> L. Cucurbitaceae	B: Uchhey H: Karela E: Bitter gourd	Leaf juice in pin worm, joint pain; fruit juice in anorexia indigestion and allergy; root on old wounds [41]; leaf in Leprosy [47]	Succulent fruit extract for protection from diabetes
<i>Persea americana</i> Mill. Lauraceae	B: Kulunashpati H: Makhanphal, E: Avocado	Fruit contain important nutrients, roots yields antibacterial, used as food preservative [37]	
<i>Syngium Cumini</i> (L) Skells. Myrtaceae	B: Jam H: Jamun E: Java plum	Bark in sore throat, bronchitis, asthma, dysentery, ulcer [36]; leaf juice in amoebiasis, as haemostatic; leaf extract and stem cover dust in old ulcers; seed in diabetes [41]	Pulp as protective to heart and from diabetes

Name of the plant with Family	Common name	Reported use	Local use and observation
Spices			
<i>Allium sativum</i> L. Amaryllidaceae	B: Ek Koshi Rosun H: Qua Losun E: Single- clove Garlic	Bulb in respiratory infections, Tuberculosis, duodenal ulcer, skin problems [37]	To control problems of blood/ purify blood and cure of chronic digestive problem, taken at empty stomach for better action.
<i>Brassica juncea</i> (L.) Czern. Brassicaceae	B: Rai Sorsey H: Rai E: Mustard	Anti-diabetic/ antihyperglycemic, antioxidant, antiatherogenic antifungal activity, antitumor activity [48]	Green leaves and seeds as gastrointestinal protective
<i>Capsicum annuum</i> L. Solanaceae	B: Lonka H: Lal mirch E: Red Pepper	Fruit antimicrobial [49]	Increase body vitality
<i>Cinnamomum verum</i> J.Presl Lauraceae	B: Daruchioni H: Dalchini E: Cinnamon	Anti-microbial, anti-oxidant, wound healing, hepato-protective [50]	As antioxidant and for restoration of body vitality
<i>Crocus sativus</i> L. Iridaceae	B: Kesor H: Keshor E: Saffron	Aphrodisiac, antispasmodic, expectorant, in stomach ailments, reducing stomach-ache and for relieving tension, measles, dysentery, jaundice, cholera; topically on skin diseases like acne [51]	
<i>Cuminum cyminum</i> L. Apiaceae	B: Jeerah H: Jeerah E: Cumin	Seed antiseptic [45]	Watery extract of seed protective to liver
<i>Curcuma longa</i> L. Zingiberaceae	B: Halud H: Haldi E: Turmeric	Stimulant, tonic; in sprains, bruises [37]; in allergy, carbuncle [41]	Succulent rhizome as curative for pimple and many other skin diseases

Contd...

Name of the plant with Family	Common name	Reported use	Local use and observation
<i>Foeniculum vulgare</i> Mill. Apiaceae	B: Mouri H: Moti saunf E: Sweet Fennel	Carminative, digestive, galactagogue, diuretic and in treating respiratory and gastrointestinal disorders [52]	A digestive stimulant
<i>Mentha longifolia</i> (L.) Huds. Lamiaceae	B: Pudina H: Pudina E: Mentha	Leaf antiseptic, stimulant, fever [37]	Leaf paste is eaten directly as anti-flatulent and digestive stimulant
<i>Pimenta dioica</i> (L.) Merr. Myrtaceae	B: Kabab chini H: Kabab Chinni E: Allspice	Antioxidant, anticancer, antibacterial, hypotensive, anti-neuralgic and analgesic properties [53]	As immunostimulant
<i>Piper nigrum</i> L. Piperaceae	B: Gol marich H: Kala mirch E: Black pepper	Cough, sinusitis, gonorrhoea, sudden pain, amoebiasis [41]; seed antimicrobial [36]	As a stress reliever and stimulant
<i>Syzygium aromaticum</i> (L.) Merrill & Perry Myrtaceae	B: Lanbanga H: Lanbang E: Clove	Buds antimicrobial [54]	As antioxidant and stimulant
<i>Trachyspermum ammi</i> (L) Sprague. Apiaceae	B: Jowan H: Ajwan E: Bishop's weed	Fruit tonic; in bronchitis, cholera, sore throat; root diuretic, febrifuge, stomach disorder; oil antiseptic, respiratory ailments [37]; seed in wound healing [55]	Seed as anti-flatulent, antiseptic to stomach and intestine
<i>Trigonella foenum-graecum</i> L. Fabaceae	B: Methi H: Methi E: Fenugreek	Seed tonic, intestinal inflammation, boils and ulcers [37]	Succulent leaves as curry, dry seeds or seed water extract in diabetes
<i>Zingiber officinale</i> Roscoe. Zingiberaceae	B: Ada H: Adrak E: Ginger	Rhizome antioxidant, stimulant [37]; common cold, anti-cholesterol [46]	Pieces of succulent rhizome taken orally with salt in pharyngitis, common cold; considered immunostimulant

Contd...

Name of the plant with Family	Common name	Reported use	Local use and observation
Other commonly used medicinal plants			
<i>Adhatoda vasica</i> Nees. Acanthaceae	B: Basak H: Vasaka E: Malabar nut	Asthma, Bronchitis, germ killer, protective for pox infection [41]	Leaf extract as expectorant, protection from respiratory infection
<i>Azadirachta indica</i> A. Juss. Meliaceae	B: Neem H: Neem E: Indian lilac	Plant antiseptic, in skin diseases [36]; immunostimulant [46]	Leaf paste mixed with succulent or dry rhizome of <i>Curcuma longa</i> L. to apply on skin for protection from diseases. Leaf juices with juice of succulent <i>Curcuma</i> rhizome taken orally as immunostimulant.
<i>Bacopa monnieri</i> (L.) Pennell. Scrophulariaceae	B: Bramhi H: Brahmi E: Thyme-leaved gratiola	Plant antimicrobial [40]	For restoration and increase of memory power; as antioxidant
<i>Catharanthus roseus</i> (L.) G.Don Apocynaceae	B: Nayantara H: Sadabahar E: Cayenne jasmine	Antitumor, anti-diabetic, antimicrobial, anti-oxidant and anti-mutagenic [56]	Succulent extract of matured leaves in diabetes
<i>Cinnamomum camphora</i> (L.) J. Presl. Lauraceae	B: Karpur H: Kapur E: Camphor tree	Antiseptic, anti-inflammatory, stimulant [37]	Immunostimulant
<i>Litsea glutinosa</i> (Lour) C.B. Robins. Lauraceae	B: Piplas/Pipulti H: Maidalakdi, E: Indian laurel.	Leaves are mucilaginous and used as/in antispasmodic, emollient, poultice, diarrhoea and dysentery, wounds, bruises [57], curing of prickly heat, summer itches and acne [16]	Leaf mucilage orally taken for cooling of body system during summer; as immunostimulant

Contd...

Name of the plant with Family	Common name	Reported use	Local use and observation
<i>Linum usitatissimum</i> L. Linaceae	B: Atasi H: Alsi E: Flaxseed, Linseed	Infectious and non-infectious diarrhoea [58], can reduce bad cholesterol [59]	Seeds eaten by chewing for protection of heart, immunostimulant
<i>Ocimum gratissimum</i> L. Lamiaceae	B: Ram tulsi H: Ram tulsi E: Wild basil	Tonic, diuretic, expectorant, styptic, antiseptic [37]	Expectorant, immunostimulant
<i>Ocimum sanctum</i> L. Lamiaceae	B: Tulsi H: Tulasi E: Holy Basil	Leaf stimulant, in bronchitis, skin infections; root in Malaria; seed in urinary tract disorders [37]	Leaf extract with honey as expectorant; immunostimulant; paste prepared by leaf of succulent <i>Piper longum</i> fruit applied to control alopecia
<i>Origanum vulgare</i> L. Lamiaceae	B: Bontulsi H: Sathra E: Oregano	Leaf oil diuretic, tonic, in whooping cough, bronchitis, rheumatism, tooth and ear ache [37]	As protective against respiratory infection
<i>Piper betel</i> L. Piperaceae	B: Pan H: Tambul E: Betel	Leaf in wounds, root with black pepper for women sterility, leaf oil in respiratory catarrh, diphtheria [37]	Anti-flatulent, Immunostimulant
<i>Piper longum</i> L. Piperaceae	B: Pipul H: Pippali E: Long pepper	Roots and fruits in diseases of respiratory tract [37]; plant antiseptic [36]	Immunostimulant, expectorant
<i>Rosmarinus officinalis</i> L. Lamiaceae	B: Rosemary H: Rosemary E: Rosemary	Leaf antimicrobial [54]	
<i>Swertia chirayita</i> (Roxb.) Buch. - Ham. ex C.B. Clarke. Gentianaceae	B: Chirata H: Chirayata E: Chirayata	Bitter tonic, febrifuge, asthma, liver diseases, internal haemorrhage of stomach [37]	As protective and curative of liver ailments, chronic diseases, indigestion

Contd...

Name of the plant with Family	Common name	Reported use	Local use and observation
<i>Tagetes patula</i> L. Asteraceae	B: Ganda H: Genda E: Merigold	Oil antiseptic, leaf juice applied to cuts and wounds [37]	Juices of succulent leaves directly applied on fresh wounds
<i>Tamarindus indica</i> L. Fabaceae	B: Tentul H: Imli E: Tamarind	Leaf in common cold, chronic amoebiasis; boiled leaf in old wound, stomatitis; fruit protective to arteriosclerosis, seed antiaging [41]; stored fruit pulp in liver ailments [60]; leaf and stem bark antimicrobial [61]; laxative, abdominal pain, diarrhoea, dysentery, peptic ulcer, spasmolytic, cancer, antimicrobial, antiparasitic, antifungal, antiviral, anti-nematodal, anti-inflammatory, antioxidant, anti-diabetic, wound healing agent [62]	3-5 year's stored pulp used in chronic diseases and as immunostimulant among patients during recovery
<i>Terminalia arjuna</i> (Roxb.) Wight & Arn. Combretaceae	B: Arjun H: Arjun E: White Marudah	Bark styptic, febrifuge; leave in ear ache [37]; bark wound healing [35]	Bark watery extract fed to heart patients
<i>Terminalia chebula</i> Retz. Combretaceae	B: Haritaki H: Haritaki E: Black- or chebulic myrobalan	Fruit tonic, bark diuretic [37]; fruit in chronic ulcers, wounds, scalds [36]	As immunostimulant, in chronic digestive problems
<i>Tinospora cordifolia</i> (Thunb.) Miers. Menispermaceae	B: Gulancha H: Giloy E: Indian Tinospora	Tonic, febrifuge, analgesic, urinary diseases, jaundice, rheumatism, Leprosy [37]; immunostimulant [46, 63]	Succulent stem as immunostimulant in herbivorous animals
<i>Withania somnifera</i> (L.) Dunal. Solanaceae	B: Aswagandha H: Aswagandha E: Indian ginseng	Root in cough, rheumatism, female disorders, ulcers; leaf febrifuge; in lesions, sore eyes [37]; immunostimulant [46]; antiseptic, in wound healing [36]	As restorative to sexual power

Table 2. Plants with reported effects against diseases of infectious origin.

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Abrus precatorius</i> L. Fabaceae	In cough and colds [37]; in cuts and wounds [64]	India
<i>Abutilon indicum</i> (Link) Sweet. Malvaceae	Febrifuge, nerve tonic, piles [37]; plant antimicrobial [40]	Tropical and subtropical regions
<i>Acacia erioloba</i> E. Mey. Fabaceae	Wood ash wound healing [42]	Southern Africa
<i>Acacia leucophloea</i> (Roxb.) Willd. Fabaceae	Bark antimicrobial [40]	India
<i>Acacia mellifera</i> Benth. Fabaceae	Root poultice wound healing [42]	African countries
<i>Acacia nilotica</i> (L.) Willd. ex Del. Fabaceae	Plant antimicrobial [40]; extract of root and stem cover, leaf, fruit used as analgesic and in stomatitis; seed in cough [41]	Africa, Middle east, Indian subcontinent
<i>Acalypha indica</i> L. Euphorbiaceae	Cutaneous problems [37]; leaf in ulcer [36]	Africa, Indian subcontinent
<i>Acalypha praemorsa</i> Blatt. & Mccan. Euphorbiaceae	Anti-Typhoid activity [37]	Africa, Arab, Indian Subcontinent
<i>Acanthospermum hispidum</i> (DC) A Chev. Asteraceae	Oil antibacterial, antifungal [37]; whole plant in skin diseases [65]	Central and South America
<i>Achillea biebersteinii</i> Afan. Asteraceae	Leaf and flower antimicrobial [66]	Russia to Arabian countries, Pakistan
<i>Achillea membranacea</i> (Labill.) DC. Asteraceae	Leaf and flower antimicrobial [67]	Turkey, Iraq, Lebanon, Syria
<i>Achillea millefolium</i> L. Asteraceae	Plant tonic, styptic, vulnerary [37]; flowerhead antimicrobial [54]	Temperate Northern Hemisphere
<i>Achyranthes aspera</i> L. Amaranthaceae	Wound healing [47]; root ointment in boils, abscesses [68]	Tropical world

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Acokanthera schimperi</i> (A.DC.) Schweinf. Apocynaceae	Leaf in Scabies, Leprosy, wounds [69]	Eastern and central Africa, Yemen
<i>Aconitum heterophyllum</i> Wall. Ex Royle Ranunculaceae	Root as febrifuge, tonic, throat infection [37]	India, Himalayan regions
<i>Acorus calamus</i> L. Acoraceae	Analgesic, abdominal tumor, dysentery [37]; rhizome antibacterial [36]	India, central Asia, Russia, eastern Europe
<i>Acronychia pedunculata</i> (L.) Miq. Rutaceae	Bark tonic, root and bark in sores and ulcers [37]	South and southeast Asia
<i>Acrostichum aureum</i> L. Pteridaceae	Rhizome applied on boils [37]	Tropical and sub-tropical areas
<i>Actiniopteris australis</i> Link. Pteridaceae	Antiseptic and styptic [37]	Africa, Arab, India to Malaysia, Australia
<i>Adansonia digitata</i> L. Malvaceae	Leaf wound healing [70]	African continent
<i>Aframomum melegueta</i> K. Schum. Zingiberaceae	Seed used in infectious diseases [71]	Western Africa
<i>Agave americana</i> L. Asparagaceae	Leaf in Scurvy, Syphilis, venereal sores [37]	Mexico, United States
<i>Agave cantala</i> (Haw.) Roxb. ex Salm-Dyck. Asparagaceae	Leaf in cuts, wounds and burns [72]	South-eastern Asia
<i>Agelanthus dodoneifolius</i> (DC) R.M. Polhil & D. Wiens. Loranthaceae	Leaf in skin diseases [73]	Western African countries
<i>Ageratina adenophora</i> (Spreng) King & H. Rob. Asteraceae	Cuts and wounds [74]	Mexico and Central America

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Ageratum houstonianum</i> Mill. Asteraceae	Leaf in cuts and wounds [32]	Central America, Mexico
<i>Aglaia odorata</i> Lour. Meliaceae	Leaf stimulant, antipyretic; flower in eruptive fever and venereal diseases [37]	China to Myanmar
<i>Agrimonia pilosa</i> Lebeb. Rosaceae	Underground part anti-bacterial; plant used as tonic [37]; in wound healing [75]	Korea, Japan, China, Siberia, Eastern Europe
<i>Albizia adianthifolia</i> W. Wight. Fabaceae	Bark and root in eczema and skin complaints [76]	Western part of Africa
<i>Albizia julibrissin</i> (Duraz) Baker Fabaceae	Seed in Leprosy [44]	Southwestern and eastern Asia
<i>Albizia lebbek</i> (L.) Benth. Fabaceae	Root cover fed in eczema, asthma and chronic diseases [41]	Indomalaya to northern Australia
<i>Alchornea cordifolia</i> Müll. Arg. Euphorbiaceae	Leaf antimicrobial [77]	Tropical Africa
<i>Alectra parasitica</i> A. Rich. <i>var chitrakutensis</i> M.A. Rau Orobanchaceae	Rhizome in Leprosy and Tuberculosis [37]	Indian subcontinent
<i>Alisma plantago-aquatica</i> L. Alismataceae	Tonic, diuretic, Hydrophobia, Leukemia, sores, ulcers and wounds [37]	Northern and central Africa
<i>Allium cepa</i> L. Amaryllidaceae	Bulb antimicrobial [78]	Worldwide as spice
<i>Aloe arborescens</i> Mill. Asphodelaceae	Leaf in wounds, burns, skin ailments [79]	Southern Africa
<i>Aloe ferox</i> Mill. Asphodelaceae	Leaf and root in bruises, burns, psoriasis, eczema, skin cancer [80]	Southern Africa
<i>Aloe vera</i> (L.) Burm.f Asphodelaceae	Leaf in dermatitis, skin disorders [37]; wound healing effect [63]	Tropical countries

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Alpina galanga</i> (L.) Willd. Zingiberaceae	Antitubercular [37]; tonic, respiratory and stomach problems, disinfectant [36]	India to Malaysia
<i>Alpinia malaccensis</i> (Burm.f.) Roscoe. Zingiberaceae	Rhizome used to treat sores [37]	Indonesia and Malaysia
<i>Alstonia scholaris</i> (L.) R.Br. Apocynaceae	Latex to sores, ulcers and tumours [37]; in skin diseases [36]	India to Malesia, Australasia
<i>Amaranthus spinosus</i> L. Amaranthaceae	Eruptive fever, shoots in eczema [37]	Tropical Americas
<i>Ammannia baccifera</i> L. Lythraceae	Anti-Typhoid, anti-tubercular, ringworm [37]	Tropical Asia, America and Africa
<i>Amorphophallus campanulatus</i> (Roxb.) Blume ex Decne. Araceae	Dysentery and piles [37]; in Leprosy [44]	Africa, South and Southeast Asia
<i>Ampelocissus latifolia</i> (Roxb.) Planch. Vitaceae	Leaf in dental problems, indolent ulcers and dysentery [37]	Indian subcontinent
<i>Amygdalus persica</i> L. Rosaceae	Leaf in sores [81]	Northwest China
<i>Anagallis arvensis</i> L. Primulaceae	Expectorant, stimulant, vulnerary, Leprosy, Hydrophobia [37]	Europe, Western Asia, North Africa
<i>Anamirta cocculus</i> (L.) Wight & Arn. Menispermaceae	Berry in ringworm and skin affections [37]	Southeast Asia
<i>Anaphalis contorta</i> (D.Don) Hook.f. Compositae	Flower heads styptic, oil antibacterial [37]	Himalayan region

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Anaphalis cinnamomea</i> (DC.) C.B. Clarke. Asteraceae	Leaf to cuts and wounds [37]	Asia and North America
<i>Anaphalis neelgerryana</i> (DC.) DC. Asteraceae	Fresh leaf on wounds and cuts [37]	Southern part of India
<i>Anaphalis triplinervis</i> (Sims.) C.B. Clarke Asteraceae	Flower paste in wound healing [55]	Himalayan region
<i>Andrographis paniculata</i> (Burm.f.) Nees. Acanthaceae	Tonic, febrifuge, Cholera, Influenza, bronchitis, piles [37]	South and south-eastern Asia
<i>Anisomeles indica</i> (L.) Kunze. Lamiaceae	Oil in uterine affection [37]; leaf wound healing [16]	Eastern Asia
<i>Annona squamosa</i> L. Annonaceae	Leaf in cuts and wounds, animal wounds [82]	Tropical Americas and West Indies
<i>Antirrhinum majus</i> L. Plantaginaceae	Leaf on tumors and ulcers [37]	Mediterranean region
<i>Antirrhinum orontium</i> L. Plantaginaceae	Leaf on tumors and ulcers [37]	Europe
<i>Apama siliquosa</i> Lam. Aristolochiaceae	Root in dysentery and Cholera, ointment in sores and ulcers [37]	Indian subcontinent
<i>Apium graveolens</i> L. Apiaceae	Leaf stimulant, fruits intestinal antiseptic, Rheumatoid arthritis [37]	Cultivated as vegetable worldwide
<i>Aporosa lindleyana</i> (Wt.) Bail. Phyllanthaceae	Leaf in burns [83]	Southern India, Sri Lanka
<i>Arabidopsis thaliana</i> (L.) Heynh. Brassicaceae	Sores in the mouth [37]	Eurasia

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Arctium lappa</i> L. Asteraceae	Root diuretic, in gout, skin affections, seed in psoriasis, acne, prurigo [37]	Eurasia
<i>Arctostaphylos uva ursi</i> (L.) Spreng. Ericaceae	Leaf antimicrobial [84]	Circumpolar in northern latitudes
<i>Ardisia solanacea</i> Roxb. Primulaceae	Root and bark in cuts and wounds [85]	Southeast Asia, west China
<i>Argyreia nervosa</i> (Burm.f.) Bojer. Convolvulaceae	Gonorrhea, strangury, chronic ulcers, eczema, other skin troubles [37]	Indian subcontinent
<i>Aristea ecklonii</i> Baker. Iridaceae	Painful rash, blisters [86]	Central and southern Africa
<i>Aristolochia bracteolata</i> Lam. Aristolochiaceae	Leaf in eczema [37]; foul ulcer [36]	Sub-Saharan Africa, Arab, India
<i>Aristolochia indica</i> L. Aristolochiaceae	Root tonic, leaf in cough, principle increase phagocytosis [37]; root in rash [65]	India and Sri Lanka
<i>Aristolochia macroura</i> Gomes. Aristolochiaceae	Stem and leaf in Rheumatism, constituent of antiseptic preparation [37]	Widespread globally
<i>Armoracia rusticana</i> G. Gaertn. B. Mey. & Scherb. Brassicaceae	Root antimicrobial [87]	Europe and western Asia
<i>Arnebia euchroma</i> (Royle) I.M. Johnst. Boraginaceae	Tooth ache, ear ache, root paste on eruptions, showed anticancer activity [37]	West and central Asia, Himalayan region
<i>Arnica montana</i> L. Asteraceae	Tonic, vulnerary, tincture in sprain and bruises [37]	Europe
<i>Artemisia absinthium</i> L. Asteraceae	Tonic, chronic fever, inflammation of liver [37]; leaf in swellings, wounds, dandruff [72]	Temperate regions of Eurasia, Africa
<i>Artemisia afra</i> Jacq. ex Willd. Asteraceae	Leaf in acne and boils [88]	South Africa

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Artemisia nilagirica</i> (C.B. Clarke) Pamp. Asteraceae	Leaf febrifuge, asthma; root tonic, antiseptic [37]; leaf wound healing [16]	Tropical Asia
<i>Artemisia roxburghiana</i> Wall. ex Besser. Asteraceae	Leaf in cuts and wounds [89]	Slopes of Himalaya
<i>Artemisia sieversiana</i> Ehrh. ex Willd. Asteraceae	Plant antimicrobial [37]	Temperate Asia, Himalayan regions
<i>Arum hygrophilum</i> Boiss. Araceae	Leaf antimicrobial [67]	Arabian Peninsula
<i>Arum discoridis</i> Sm. Araceae	Leaf antimicrobial [67]	East of the Mediterranean sea
<i>Aruncus dioicus</i> (Walter) Fernald. Rosaceae	Principle antibacterial [37]	Temperate areas
<i>Asclepias curassavica</i> L. Apocynaceae	Root in piles, gonorrhoea; leaf juice in cancer; latex in warts and corns [37]	American tropics
<i>Aspalathus linearis</i> (Burm.f.) R. Dahlgren. Fabaceae	Leaf in eczema [79]	South Africa
<i>Asparagus gonoclados</i> Baker. Asparagaceae	Used in skin troubles [37]	Indian subcontinent
<i>Asparagus racemosus</i> Willd. Asparagaceae	Leaf immunostimulant [46]; nerve tonic, antimicrobial [45]	Himalayan region, India, Sri Lanka
<i>Aspilia africana</i> C.D. Adams. Compositae	Leaf antimicrobial [90]	Tropical Africa
<i>Aspilia natalensis</i> (Sond.) Wild. Asteraceae	Leaf in wounds and sores [87]	Africa, Madagascar, Latin America

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Asplenium trichomanes</i> L. Aspleniaceae	Expectorant, abscesses of uterus [37]	Worldwide in rocky areas
<i>Astragalus leucocephalus</i> Bunge. Leguminosae	Asthma, respiratory infection [41]	Himalayan region
<i>Aster amellus</i> L. Asteraceae	Root in cough, pulmonary affections, malarial fever, haemorrhage [37]	European mountains, western Asia
<i>Aster bakeranus</i> Burt Davy ex C. A. Sm. Asteraceae	Root in sores [87]	South Africa
<i>Astragalus multiceps</i> Wall. Fabaceae	Seeds in colic and Leprosy [37]	Himalayan region
<i>Athrixia phylicoides</i> DC. Asteraceae	Sores and boils [87]	Southern Africa
<i>Azanza lampas</i> (Cav.) Alef. Malvaceae	Root and fruit in Gonorrhoea and Syphilis, floral parts in cutaneous diseases [37]	China, India to Malaysia
<i>Bambusa bambos</i> (L.) Voss. Poaceae	Latex of heated branches in ear ache [16] leaf and flower for speedy delivery and evacuation of placenta, root in strangury and oedema [41]	Southern Asia
<i>Baptisia australis</i> Hort. ex Lehm. Fabaceae	Root in tooth ache [91]	North America
<i>Barleria lupulina</i> Lindl. Acanthaceae	Leaf in wound healing [92, 35]	Southeast Asia
<i>Barleria prionitis</i> L. Acanthaceae	Leaf in catarrhal affections, tooth ache; root febrifuge, boils, glandular swellings [37]	India, Sri Lanka, Africa
<i>Barleria rigida</i> Willd. ex Nees. Acanthaceae	Root and leaf in wound healing [70]	Sothern Africa
<i>Basella alba</i> L. Basellaceae	Leaf externally on pimples and warts: leaves boiled in mustard oil in ulcers; orally in cough and elephantiasis [41]	Tropical Asia and Africa

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Bauhinia acuminata</i> L. Fabaceae	Bark and leaf in Asthma, bladder stone and Leprosy [37]	South-eastern Asia
<i>Bauhinia rufescens</i> Lam. Fabaceae	Diarrhoea and dysentery; bark and root in Leprosy; leaf in eye troubles [37]	African countries
<i>Bauhinia petersiana</i> Bolle. Fabaceae	Leaf in wound healing [70]	African countries
<i>Bauhinia vahlii</i> Wright & Arn. Fabaceae	Root in cuts, wounds [93]	Himalayan regions
<i>Bauhinia variegata</i> L. Caesalpiniaceae	Root to prevent obesity, bark in cutaneous trouble, ulcer, Leprosy [37]	South and Southeast Asia
<i>Begonia cucullate</i> Willd. var. <i>hookeri</i> (A.DC.) L.B.Sm. & B.G. Schub. Begoniaceae	Leaf and flower antibacterial [37]	Tropical countries
<i>Begonia heracleifolia</i> Cham. & Schltl. Begoniaceae	Leaf and flower antibacterial [37]	Tropical and subtropical regions
<i>Begonia palmata</i> Don. Begoniaceae	Extract of succulent stalk in venereal diseases [37]	Himalayan regions
<i>Berberis aquifolium</i> Purs. Berberidaceae	Plant extract anti-psoriasis [94]	Western North America
<i>Berberis aristata</i> DC. Berberidaceae	Stem in intermittent fever [37]; root and stem in ulcer and sore [36]; root in Jaundice [41]	Temperate and sub-tropical regions
<i>Berberis vulgaris</i> L. Berberidaceae	Infectious diseases, antiseptic, disinfectant [95]; fruits in respiratory disorder, fever, cold, flu[96]	Worldwide
<i>Bergenia ciliata</i> (Haw.) Sternb. Revis. Saxifragaceae	Rhizomes in diarrhoea, spleen enlargement, renal and pulmonary affections [37]	Himalayan region
<i>Bergia odorata</i> Edgew. Elatinaceae	Leaf in bone fracture and sores [37]	Western India to Arab and Africa

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Beta vulgaris</i> L. Amaranthaceae	Leaf in burns, inflammations [44, 47]	Europe, north Africa to western Asia
<i>Betula alnoides</i> Buch-Ham. Betulaceae	Bark in wound healing [75]	Himalayan region
<i>Betula utilis</i> D. Don. Betulaceae	Bark as antiseptic [37]	Himalayan region
<i>Bidens bipinnata</i> L. Asteraceae	Expectorant, eye and ear drop; root and seed in asthma [37]	Asia and North America
<i>Bidens biternata</i> (Lour.) Merr. & Sherff. Asteraceae	Leaf in cuts and wounds [32]	Tropical Africa, India to Malaysia
<i>Bidens pilosa</i> L. Asteraceae	Tonic, diuretic, febrifuge, skin troubles, fistula, Leprosy; leaf in eye and ear troubles [37]	America
<i>Bidens tripartite</i> L. Asteraceae	Haematuria, chronic dysentery, eczema; seed as expectorant, diuretic, urinary stones [37]	Eurasia, North Africa, North America
<i>Biophytum sensitivum</i> (L.) DC. Oxalidaceae	Tonic, tumours; leaf and root styptic, leaf in diabetes, asthma, Phthisis; seed on abscesses [37]	Southeast Asian countries
<i>Blechnum orientale</i> L. Blechnaceae	Rhizome in urinary disorders and boils [37]	East and south east Asia, Australia
<i>Blumea lacera</i> (Burm.f.) DC. Asteraceae	Wound healing [92]; febrifuge, diuretic [37]	Southeast Asia
<i>Boerhavia diffusa</i> L. Nyctaginaceae	Root expectorant, diuretic, Asthma [37]; Gonorrhoea [36]; immunostimulant [46]	India, southern United States
<i>Bombax ceiba</i> L. Malvaceae	Bark tonic, styptic; fruit expectorant, diuretic, urinary calculi, ulceration [37]; antimicrobial [97]	India, south-eastern Asia
<i>Boophane disticha</i> L.F. Amaryllidaceae	Bulb in septic wounds, boils, external sores, rheumatism [80]	African countries

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Borago officinalis</i> L. Boraginaceae	Urinary tract affections, skin diseases [37]	Mediterranean region
<i>Boschniakia himalaica</i> Hook f. & Thomson. Orobanchaceae	Wound healing [75]	Himalayan region
<i>Boswellia serrata</i> Triana & Planch. Burseraceae	Bark in diarrhea, skin troubles; gum expectorant, diuretic, dysentery, pulmonary affections [37]	India and Pakistan
<i>Botrychium lunaria</i> (L.) Sw. Ophioglossaceae	Dysentery, cuts, wounds, ruptures; root and frond in breast cancer [37]	Worldwide
<i>Botrychium virginianum</i> (L.) Sw. Ophioglossaceae	Dysentery, fresh root on cuts and bruises [37]	Himalayan regions, parts of Europe, USA
<i>Brassica nigra</i> L. Brassicaceae	Leaf and flower in Leprosy [98]	South Europe and south Asia
<i>Breynia vitis-idaea</i> (Burn.f.) C.E.C. Fisher. Phyllanthaceae	Leaf on suppurative wounds, hemostatic, tonsillitis; bark astringent, hemostatic [37]	India to Indonesia
<i>Bridelia micrantha</i> Baill. Phyllanthaceae	Bark in burns and wounds [88]	African countries
<i>Brucea javanica</i> (L.) Merr. Simaroubaceae	Fruit in malignant Malaria, diarrhoea, dysentery; leaf in skin troubles; seed oil in papilloma [37]	China, India to Malaysia, Australia
<i>Brunfelsia uniflora</i> (Pohl) D. Don. Solanaceae	Roots in Rheumatism and Syphilis [37]	South America
<i>Bryophyllum pinnatum</i> (Lam.) Oken. Crassulaceae	Leaf in wounds, bruises, boils, sloughing ulcers [37]	Madagascar

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Buchanania cochinchinensis</i> (Lour.) M. R. Almeida. Anacardiaceae	Seed and leaf in skin diseases [99]	China, India to Malaysia
<i>Buddleja globosa</i> Hope. Buddlejaceae	Shout in stomach ulcers, leaf in dysentery [37]	Chile and Argentina
<i>Buddleja madagascariensis</i> Lam. Buddlejaceae	Leaf in bronchitis, asthma and cough [37]	Madagascar
<i>Bulbine frutescens</i> (L) Willd. Asphodelaceae	Leaf in wounds, burns, skin rash, itchiness, ringworm [100]	Southern Africa
<i>Bulbine natalensis</i> Rooiwortel. Asphodelaceae	Leaf in wounds and burns [80]	Southern and southeastern Africa
<i>Butea monosperma</i> (Lam.) Taub. Fabaceae	Seed in herpes [37]; in ringworm [36]	Southeast Asia
<i>Buxus wallichiana</i> Baill. Buxaceae	Leaf in Rheumatism and Syphilis; bark as febrifuge [37]	Himalayan region
<i>Byttneria herbacea</i> Roxb. Malvaceae	Root in Cholera and diarrhoea [37]	Peninsular India
<i>Calendula officinalis</i> L. Asteraceae	Diuretic, stimulant [37]; wound healing [101]	Southern Europe
<i>Callicarpa arborea</i> Roxb. Verbenaceae	Bark in cutaneous ailments [37]	China and Southeast Asia
<i>Callicarpa tomentosa</i> (L.) L. Lamiaceae	Bark in skin troubles, hepatic obstructions, fever; leaf in aphthae of mouth [37]	India and Sri Lanka

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Calophyllum inophyllum</i> L. Calophyllaceae	Seed oil in rheumatism, skin affections; bark in orchitis, indolent ulcers [37]	East Africa, India to Malesia, Australia
<i>Calotropis gigantean</i> (L.) W.T. Aiton. Asclepiadaceae	Cuts and wounds, Leprosy [44, 32]	China, India to Malaysia, tropical Africa
<i>Calotropis procera</i> W.T. Aiton. Apocynaceae	Root bark in Leprosy [37]; antimicrobial [40]	Tropical Africa, India, China
<i>Calpurnia aurea</i> (Ait.) Benth. Fabaceae	Leaf in wound, Scabies [69]	African countries
<i>Calycopteris floribunda</i> (Roxb.) Lam. Combretaceae	Leaf tonic, astringent, in ulcers [37]	Indian subcontinent
<i>Campsis radicans</i> Seem. Bignoniaceae	Root for healing of wounds [37]	Eastern United States
<i>Cannabis sativa</i> L. Cannabinaceae	Oil used in Leprosy [44]	Many countries throughout the globe
<i>Canscora decussata</i> (Roxb.) Schult. Gentianaceae	Juice in insanity, epilepsy, nervous debility [37]; Leprosy [44]	Burma, India
<i>Canthium dicoccum</i> (Gaertn) Merr. Rubiaceae	Used in dandruff [65]; antimicrobial [102]	Southeast China to tropical Asia
<i>Capparis sepiaria</i> L. Capparaceae	Tonic, febrifuge, skin problems [37]	India to Malaysia, China, tropical Africa
<i>Capparis spinosa</i> L. Capparaceae	Bark diuretic, expectorant, tonic, liver affections, rheumatism, glandular Tuberculosis [37]	Parts of Asia, Africa, Australia, Europe
<i>Capparis tomentosa</i> Lam. Capparaceae	Root in wounds, Leprosy [88]	African countries

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Capparis zeylanica</i> L. Capparaceae	Root bark in Cholera [37]; immunostimulant, in wound healing [103]	Indian subcontinent, China
<i>Capsella bursa-pastoris</i> (L.) Medik. Brassicaceae	Dysentery, diuretic, febrifuge, homeostatic; ailments of eye in Chinese medicine [37]	Eastern Europe, Asia minor
<i>Cardiospermum halicacabum</i> L. Sapindaceae	Leaf in body sores [88]	Tropical and subtropical Africa and Asia
<i>Carpobrotus edulis</i> (L.) N.E.Br. Aizoaceae	Leaf in eczema, wounds, burns [80]	South Africa
<i>Carthamus oxyacantha</i> M. Bieb. Asteraceae	Oil on ulcers and itches [37]	Eastern Mediterranean to India
<i>Carthamus tinctorius</i> L. Asteraceae	Oil on sores and rheumatic swellings [37]	Worldwide
<i>Cassia auriculata</i> L. Fabaceae	Bark astringent, seed in eye troubles, diabetes, chylous urine; root in skin troubles [37]	India and Sri Lanka
<i>Cassia sophora</i> L. Fabaceae	Root extract in asthma, root cover in old wounds, ringworm and psoriasis [41]	Tropical countries
<i>Cassine transvaalensis</i> (Burt Davy) Codd. Celastraceae	Bark in skin rashes, infections, inflammation [70]	Southern Africa
<i>Cassytha filiformis</i> L. Lauraceae	Bilious affections, urethritis, chronic dysentery, eye and skin infections [37]	Pantropical
<i>Cayratia carnos</i> a (Lam.) Gagnep. Vitaceae	Root with pepper on boils; leaf on yoke sore of bullocks [37]	India to Malaysia, China, Australia
<i>Cedrela toona</i> Roxb. ex Rottle. Meliaceae	Bark in chronic dysentery, ulcers [37]	Southern Asia, Australia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Cedrus deodara</i> (Roxb.) G. Don. Pinaceae	Oil in ulcer and skin diseases [37]	Himalayan region
<i>Celosia argentea</i> L. Amaranthaceae	Seeds in diarrhoea, eye troubles, sore mouth [37]	Tropical countries
<i>Celosia trigyna</i> L. Amaranthaceae	Leaf in boils and skin complaints [80]	Tropical Africa
<i>Centranthera indica</i> (L.) Gamble. Orobanchaceae	Febrifuge, eye sore [37]	Himalayan regions, Australia, Sri Lanka
<i>Centratherum anthelminticum</i> Kuntze. Asteraceae	Seed stimulant, antiseptic [36]	Indian subcontinent
<i>Ceriops tagal</i> (Pers.) C.B.Rob. Rhizophoraceae	Bark in malignant ulcers, haemorrhages [37]	Africa, China, India to Malaysia
<i>Cetraria islandica</i> (L.) Ach. Parmeliaceae	Tonic, chronic catarrh, bronchitis [37]	Mountainous Northern Hemisphere
<i>Champereia griffithii</i> Planch. ex Kurz. Opiliaceae	Leaf and root on ulcers [37]	China to Malaysia
<i>Chenopodium album</i> L. Amaranthaceae	Leaf in skin diseases [47,72]; in wound healing [75]	Worldwide
<i>Chenopodium ambrosioides</i> Bert. ex Steud. Amaranthaceae	Eczema [88]	Parts of Africa and America
<i>Chenopodium schraderianum</i> Schult. Amaranthaceae	Leaf antimicrobial [66]	India, South Africa, Americas, Australia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Chironia baccifera</i> L. Gentianaceae	Leprosy, boils, acne, sores [88]	African countries
<i>Chlorophytum borivilianum</i> Santapau & R.R. Fern. Asparagaceae	Root antimicrobial [40]	Indian peninsula
<i>Chlorophytum laxum</i> R.Br. Asparagaceae	Tuber and leaf antimicrobial [40]	Africa, Asia, Australia
<i>Chlorophytum tuberosum</i> (Roxb.) Baker. Asparagaceae	Root antimicrobial [40]	Parts of Africa, India
<i>Chloroxylon swietenia</i> DC. Rutaceae	Leaf in cuts, cattle wounds [104]	India, Sri Lanka, Madagascar
<i>Chondrus crispus</i> Stackh. Gigartinaceae	Stimulant, cough, bronchitis, problems of blooder, kidney, skin [37]	Atlantic coast of Europe, North America
<i>Chrysocoma ciliata</i> L. Asteraceae	In wounds [70]	Africa, Australia
<i>Cichorium intybus</i> L. Asteraceae	Viral hepatitis in Unani medicine [46]	Europe, North America
<i>Cinchona ledgeriana</i> Moens ex Tremen. Rubiaceae	Bark febrifuge, tonic [37]; antimicrobial [36]	India, Java, Colombia, Bolivia
<i>Cinnamomum pauciflorum</i> Nees. Lauraceae	Bark cardi tonic, antiseptic [37]	China, Indian subcontinent
<i>Cipadessa baccifera</i> (Roth) Miq. Meliaceae	Leaf in wounds [65]	India, Sri Lanka

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Cirsium sinense</i> C.B. Clarke. Compositae	Root in ulcers, abscesses [37]	China, Japan
<i>Cirsium verutum</i> (D. Don.) Spreng Asteraceae	Leaf in wound healing [75]	Himalayan region
<i>Cissampelos capensis</i> L.f. Menispermaceae	Boils, sores, ulcers, Syphilis, snakebite wounds [79]	African countries
<i>Cissampelos pareira</i> L. Menispermaceae	Diuretic, dyspepsia, urinary troubles [37]; Leprosy [105]	India, China, some African countries
<i>Cissus adnate</i> Roxb. Vitaceae	Tuber diuretic, in cuts, fractures [37]	Asia, Australia
<i>Cissus quadrangularis</i> L. Vitaceae	Juice in scurvy, root in fracture [37]; shoot in wound healing [106]	Indian subcontinent
<i>Citrullus colocynthis</i> (L.) Schrad. Cucurbitaceae	Root in jaundice, rheumatism, urinary troubles [37]; Leprosy [98]	Mediterranean basin, Asia
<i>Citrusparadise</i> Macfad. Rutaceae	Build up resistance [37]; seed anti-microbial [107]	Barbados
<i>Cladonia alpestris</i> (L.) Rabenh. Cladoniaceae	Tuberculosis [37]	America, Europe
<i>Clausena pentaphylla</i> (Roxb.) DC. Rutaceae	Bark in wounds and sprains of animals [37]	Sub-Himalayan India
<i>Clematis gouriana</i> Roxb. ex DC. Ranunculaceae	Leaf in cuts, wounds, burns [108]	China, Indian subcontinent, Malaysia
<i>Clematis triloba</i> Heyne ex Roth. Ranunculaceae	Leprosy [37]	Part of Northern Hemisphere

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Cleome chelidonii</i> L. f. Cleomaceae	Gingivitis, skin troubles [37]	India, Myanmar, Thailand, Indonesia
<i>Cleome ramosissima</i> Webb ex Parl. Cleomaceae	Aerial parts antimicrobial [66]	Arabian countries
<i>Cleome viscosa</i> L. Cleomaceae	Leaf in cuts and wounds [109]	Tropics with good rainfall
<i>Clerodendrum indicum</i> (L.) Kuntze. Lamiaceae	Root in asthma, cough, Tuberculosis like infections [37]	China, India to Malaysia
<i>Clerodendrum phlomidis</i> L.f. Lamiaceae	Root in Gonorrhea [37]	India and Sri Lanka
<i>Cnicus benedictus</i> L. Asteraceae	Wounds, ulcers [79]	Mediterranean region
<i>Clitoria ternatea</i> L. Fabaceae	Goiter, hysteria, edema, laryngitis, cough, throat infection, skin infection [41]	Thailand to Malaysia, introduced elsewhere
<i>Coccinia grandis</i> (L.) Voigt. Cucurbitaceae	Leaf in carbuncle, scabies, ulcer, abscess [16]	Africa to Asia
<i>Cocculus hirsutus</i> (L.) Diels. Menispermaceae	Leaf in cuts, wounds, boils, Gonorrhoea, urinary troubles, eczema [110]; liver protection [60]	India, Pakistan, tropical Africa
<i>Cocos nucifera</i> L. Arecaceae	Root in prostate enlargement, irregular period of ladies, dry fruit in tape worm infection [41]; oil anti-microbial [111]	Tropical countries
<i>Codonopsis ovata</i> Benth. Campanulaceae	Root and leaf in ulcers and wounds [37]	Western Himalayan region
<i>Coelogyne cristata</i> Lindl. Orchidaceae	Pseudobulb in wound healing [112]	Eastern Himalayas and Vietnam

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Coix lacryma-jobi</i> L. Poaceae	Affections of respiratory and urinary tract [37]	Southeast Asia
<i>Colebrookea oppositifolia</i> Sm. Lamiaceae	Leaf on wound and bruises, root in epilepsy [37]	Himalayan region
<i>Coleus amboinicus</i> Lour. Lamiaceae	Leaf in chronic cough, asthma, urinary diseases [37]	Southern and Eastern Africa
<i>Combretum kraussii</i> Hochst. Combretaceae	Root in wound dressing [113]	African countries
<i>Combretum molle</i> R.Br. ex G. Don. Combretaceae	Leaf in wound dressing [88]	African countries
<i>Commelina benghalensis</i> L. Commelinaceae	Leprosy [37]; leaf in wounds [32]	Tropical Asia and Africa
<i>Commelina nudiflora</i> L. Commelinaceae	Leaf in sores, boils, itches and burns [37]	India, Bangladesh
<i>Commicarpus grandiflorus</i> (A. Rich.) Standl. Nyctaginaceae	Plant antimicrobial [66]	Northern Africa, Arab
<i>Commicarpus lumbagineus</i> (Cav.) Standl. Nyctaginaceae	Leaf antimicrobial [66]	Tropical Africa to southern Spain
<i>Commiphora mukul</i> (Stocks) Hook. Burseraceae	Diuretic, expectorant, uterine stimulant, rheumatism, antiseptic [37]	Northern Africa to central Asia, India
<i>Commiphora myrrha</i> (Nees) Eng. Burseraceae	Resin anti-microbial [114]	Arabian Peninsula

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Connarus monocarpus</i> L. Connaraceae	Fruit in eye troubles, root oil on swelling, bark in ulcers [37]	India and Sri Lanka
<i>Conyza aegyptiaca</i> (L.) Aiton. Asteraceae	Leaf in skin diseases [115]	Tropical and warm temperate regions
<i>Cordia dichotoma</i> G.Forst. Boraginaceae	Fruit in diseases of chest and urinary passage [37]	India to Malaysia, Australia
<i>Cordia wallichii</i> G. Don. Boraginaceae	Fruit in bronchial affections [37]	Peninsular India
<i>Coriandrum sativum</i> L. Apiaceae	Oil in wound healing [35]	Hot part of Europe, Africa and Asia
<i>Cordyceps sinensis</i> (Berk.) Sacc. Ophiocordycipitaceae	Boost cellular immunity, asthma, Tuberculosis, bronchitis, kidney troubles [116]	Nepal, Tibet, Sikkim of India
<i>Corydalis gowaniana</i> Wall. Papaveraceae	Root tonic, diuretic; in syphilitic, scrofulous, cutaneous affections [37]	Himalayan region
<i>Coscinium fenestratum</i> (Goetgh.) Colebr. Menispermaceae	Febrifuge, dressing of wounds and ulcers [37]; stem and root antiseptic [36]	South and Southeast Asia
<i>Costus speciosus</i> (J. Konig) C. Specht. Costaceae	Rhizome in skin diseases [36]	Southeast Asia
<i>Cotyledon orbiculata</i> L. Crassulaceae	Leaf in corns, warts, boils [80]	Southern Africa
<i>Crateva nurvala</i> Buch. - Ham. Capparaceae	Bark stimulate liver, in calculus and other urinary affections [37]; kidney stone [46]	China, India, southeast Asia
<i>Crinum defixum</i> Ker Gawl. Amaryllidaceae	Bulb in burns, whitlow, carbuncles [37]	Indian peninsula

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Crinum macowanii</i> Baker. Amaryllidaceae	Bulb and leaf in sores, boils and acne [42]	Africa
<i>Croton bonplandianum</i> Baill. Euphorbiaceae	Leaf in wound healing [117], haemostasis [118]	South America, Asia
<i>Croton lechleri</i> Müll.Arg. Euphorbiaceae	Resin antimicrobial [119]	South America
<i>Cryptolepis sanguinolenta</i> (Lindl.) Schltr. Asclepiadaceae	Root in hepatitis, urinary tract infections, stomach ache, tonic [120]	Some African countries
<i>Cucumis melo</i> L. Cucurbitaceae	Seeds diuretic, pulp in chronic eczema [37]; used in urinary obstruction and tract infection [41]	Iran, Anatolia, Caucasus area
<i>Cucumis myriocarpus</i> E. Mey. ex Naud. Cucurbitaceae	Fruits in boils, abscesses [88]	Tropical and southern Africa
<i>Cucurbita maxima</i> Duch. Cucurbitaceae	Seed as tonic, diuretic; fruit pulp on boils, burns, inflammation [37]	Worldwide
<i>Cullen corylifolium</i> (L.) Medik. Fabaceae	Fruit diuretic, leukoderma, Leprosy, Psoriasis, diseases of skin [37]; antibacterial [36]	China, India to Malaysia
<i>Curculigo orchioides</i> Gaertn. Hypoxidaceae	Tuberous root diuretic, tonic; in piles, diarrhoea, jaundice, asthma, skin troubles [37]	China, Japan, Indian subcontinent
<i>Curcuma amada</i> Roxb. Zingiberaceae	Rhizome wound healing [35]	South and southeast Asia
<i>Cyathula prostrata</i> (L.) Blume Amaranthaceae	Root in dysentery, skin complaints [37]	Widespread in tropics

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Cymbopogon flexuosus</i> (Nees ex Steud.) W. Watson. Poaceae	Stomachic, anti-microbial [45]	India, Sri Lanka, Burma, Thailand
<i>Cymbopogon jwarancusa</i> (Jones) Schult. Poaceae	Cough, rheumatism, dyspepsia, gout, Cholera [37]	South east Asia
<i>Cynodon dactylon</i> (L.) Pers. Poaceae	Leaf diuretic; rhizome in genito-urinary troubles [37]; wound healing [92]	Warm climates worldwide
<i>Cynometra ramiflora</i> L. Leguminosae	Seed oil in Leprosy and skin diseases [37]	India to Myanmar
<i>Cyperus rotundus</i> L. Cyperaceae	Amoebiasis, epilepsy, wound, mastitis, Pyorrhoea [41]	Africa, Asia, Europe
<i>Dactylorhiza hatagirea</i> (D.Don) Soo. Orchidaceae	Tuber in cuts and wounds [121]	Himalayan region
<i>Dalbergia sympathetica</i> Nimmo ex Grah. Fabaceae	Bark paste on pimples [37]	Western Ghats, India
<i>Daphne oleoides</i> Schreber. Thymelaeaceae	Bark and leaf in skin troubles [37]	Southern Europe, Africa, Asia Minor
<i>Datura metel</i> L. Solanaceae	Seed and flower in Psoriasis [122]	Warmer parts of the world
<i>Datura stramonium</i> L. Solanaceae	Leaf in boils, abscesses, wounds [80]	North America
<i>Deeringia amaranthoides</i> (Lam.) Merr. Amaranthaceae	Leaf on sores [37]	China, India to Malaysia, Australia

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Delphinium denudatum</i> Wall. Ranunculaceae	Root stimulant, tonic; in tooth ache [37]	Western Himalayas
<i>Delphinium elatum</i> L. Ranunculaceae	Seed in skin diseases, flower in eye troubles [37]	Europe to north and central Asia
<i>Dendrobium crumenatum</i> Sw. Orchidaceae	Leaf on boils, pimples; herb in nervous affections [37]	India to Malaysia
<i>Dendrophthoe pentandra</i> (L.) Miq. Loranthaceae	Leaf on sores, ulcers [37]	China, India to Malaysia
<i>Dentella repens</i> (L.) J.R. Forst. & G. Forst. Rubiaceae	Leaf in sores [37]	India to Malaysia
<i>Desmodium velutinum</i> (Willd.) DC. Fabaceae	Leaf in skin diseases [32]	Madagascar, China, Indian to Malaysia
<i>Desmostachya bipinnata</i> (L) Stapf. Poaceae	Dysmenorrhea, gallstone (with <i>Tribulus terrestris</i> and <i>Crataeva religiosa</i>), piles, wounds [41]	Tropical Asia and Africa
<i>Dichrostachys cinerea</i> (L.) Wight & Arn. Fabaceae	Bark in abscesses and other skin affections [88]	Africa, Indian subcontinent, Australia
<i>Dicoma anomala</i> Sond. Asteraceae	Wounds, ulcers, ringworm, head sores [88]	Southern Africa
<i>Dicoma tomentosa</i> Cass. Asteraceae	Febrifuge, in putrescent wounds [37]	Africa, Indian subcontinent
<i>Dictamnus albus</i> L. Rutaceae	Root bark in nervous diseases, plant in scabies, skin affections [37]	Warm part of Europe, Africa, Asia
<i>Digitalis purpurea</i> L. Plantaginaceae	Leaf in wound, burn [36]	Temperate Europe

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Dillenia pentagyna</i> Roxb. Dilleniaceae	Bark in cuts and burns [123]	Southern Asia, Australia
<i>Dioscorea alata</i> L. Dioscoreaceae	Tuber in Leprosy and piles [37]	Tropical Asia
<i>Dioscorea bulbifera</i> L. Dioscoreaceae	Tuber in ulcers, piles, dysentery [37]	Africa, southern Asia
<i>Dioscorea dregeana</i> T. Durand & Schinz. Dioscoreaceae	Tuber in cuts and sores [80]	South Africa
<i>Diospyros malabarica</i> (Desr.) Kostel. Ebenaceae	Bark in dysentery, febrifuge; fruit as gargle in aphthae, sore throat [37]	Indian subcontinent, south east Asia
<i>Diospyros melanoxylon</i> Roxb. Ebenaceae	Leaf diuretic, styptic; flowers in urinary and skin troubles [37]	India, Sri Lanka
<i>Diospyros mespiliformis</i> Hochst. ex A. DC. Ebenaceae	Root, leaf in skin rash, bruises, wounds, ringworm [70]	Savannas of Africa
<i>Diospyros paniculata</i> Dalzell. Ebenaceae	Fruits on burns [37]	Indian peninsula
<i>Diospyros racemosa</i> Roxb. Ebenaceae	Gum from cut trees in tooth ache [37]	India, Sri Lanka
<i>Diploclisia glaucescens</i> (Bl.) Diels Menispermaceae	Leaf in Syphilis, Gonorrhea [37]	Indo-Malesia, China
<i>Dipteracanthus suffruticosus</i> (Roxb.) Voigt. Acanthaceae	Root in renal affections [37]	India

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Dipterocarpus tuberculatus</i> Roxb. Dipterocarpaceae	Oleoresin on ulcers in Burma [37]	Bangladesh to Vietnam
<i>Dipterocarpus turbinatus</i> C.F. Gaertn. Dipterocarpaceae	Oleoresin to ulcers, ringworm and other cutaneous diseases [37]	India and south east Asia
<i>Dipterygium glaucum</i> Decne. Capparaceae	Leaf antimicrobial [66]	Egypt to Pakistan
<i>Dodonaea angustifolia</i> L.f. Sapindaceae	Leaf and twig antipruritic, boils, skin diseases of the head and face [80]	Africa to Arabia, Australia, New Zealand.
<i>Dodonaea viscosa</i> Jacq. Sapindaceae	Leaf febrifuge, in burns and wounds [37]	Parts of Africa, America, Asia, Australia
<i>Dolichandrone spathacea</i> (L.f.) Seem. Bignoniaceae	Seed antiseptic, in spasmodic affections [37]	Southern India, Sri Lanka
<i>Dolichos trilobus</i> L. Fabaceae	Seed in rheumatism, root in ophthalmia, skin diseases [37]	Tropical Africa, Arabia to south Asia
<i>Dregea volubilis</i> (L. f.) Benth. ex Hook. f. Apocynaceae	Leaf in boils and abscesses [37]	India
<i>Drymaria cordata</i> (L.) Willd. Caryophyllaceae	Juice febrifuge [37]; leaf in cuts, burns, wounds [32]	Africa, America, India
<i>Drynaria quercifolia</i> (L.) J. Sm. Polypodiaceae	Rhizome antibacterial [37]	India to Malaysia, Australia
<i>Dysoxylum malabaricum</i> Bedd. ex Hiern. Meliaceae	Wood oil in ear and eye diseases [37]	India

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Ecbalium elaterium</i> (L) A. Rich. Cucurbitaceae	Fruit antimicrobial [67]	Europe, northern Africa, temperate Asia
<i>Ecbolium viride</i> (Forssk.) Alston. Acanthaceae	Root in jaundice, rheumatism, leaf in stricture [37]; leaf and flower antimicrobial [66]	India, Sri Lanka, Bangladesh
<i>Echinacea purpurea</i> (L) Moench. Asteraceae	Plant is antimicrobial [124]	North America, Canada
<i>Echinacea angustifolia</i> DC. Asteraceae	Plant is antimicrobial [124]	North America, Canada
<i>Echinacea pallida</i> (Nutt.) Nutt. Asteraceae	Plant is antimicrobial [124]	North America, Canada
<i>Echium arabicum</i> R. Mill. Boraginaceae	Leaf antimicrobial [66]	Arabian countries
<i>Eclipta prostrata</i> (L.) L. Asteraceae	Leaf tonic, hepatic and spleen enlargement, hair treatment, skin troubles, wound of animals [37]	Widespread
<i>Ekebergia capensis</i> Sparrm. Meliaceae	Bark in abscesses, boils and acne [125]	African countries
<i>Elaeocarpus glandulosus</i> Wall. ex Merr. Elaeocarpaceae	Fruits in rheumatism, pneumonia, Leprosy, dropsy [37]	Southern part of India
<i>Elaeocarpus tuberculatus</i> Roxb. Elaeocarpaceae	Fruits in Typhoid, rheumatism, epilepsy [37]	India to Malaysia
<i>Elephantopus scaber</i> L. Asteraceae	Root and leaf in diarrhoea, dysentery; root in tooth ache; leaf in eczema, ulcers [37]	Tropical Africa, part of Asia, Australia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Elephantorrhiza elephantina</i> (Burch.) Skeels. Fabaceae	Root and rhizome in acne, wounds, burns and other skin diseases [126]	Southern Africa
<i>Elettaria cardamomum</i> (L.) Maton Zingiberaceae	Seed antimicrobial [127]	Southern India
<i>Elytraria acaulis</i> (L. fil.) Lindau. Acanthaceae	Cough of infants, leaf in venereal diseases [37]	Africa and India
<i>Embelia ruminata</i> (E. Mey. ex A.Dc.) Mez. Myrsinaceae	Tender leaf in open wounds, Leprosy [126]	African countries
<i>Embelia ribes</i> Burm.f. Primulaceae	Fruits as tonic, anthelmintic, in chest and skin troubles [37]	Indian subcontinent
<i>Embelia tsjeriam-cottam</i> (Roem. & Schult.) A. DC Primulaceae	Antibacterial and anti-tubercular [36]	India and Myanmar
<i>Emilia sonchifolia</i> (L.) DC. ex Wight Asteraceae	Febrifuge, leaf in eye sores and night blindness [37]	Tropical world
<i>Eminium spiculatum</i> (Blume) Schott. Araceae	Antimicrobial [67]	Lebanon and surrounding area
<i>Entada rheedei</i> Spreng. Fabaceae	Stem in Scabies [65]	Tropics and subtropics
<i>Enteromorpha intestinalis</i> (Lin.) Nees. Ulvaceae	Tuberculosis [37]	Many parts of the sea
<i>Ephedra gerardiana</i> Wallich ex C. A. Meyer Ephedraceae	Asthma, berries in respiratory troubles [37]	Himalayan regions

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Equisetum arvense</i> L. Equisetaceae	Renal affections [37]	Arctic and temperate Northern Hemisphere
<i>Equisetum debile</i> Roxb. ex Vaucher Equisetaceae	Gonorrhea [37]	South east Asia
<i>Erigeron Canadensis</i> (L.) Cronquist Asteraceae	Stimulant, haemostatic; in diarrhoea, dysentery, renal affections, ringworm, eczema [37]	North and central America
<i>Eriolaena quinquelocularis</i> (Wight & Arn.) Wight. Malvaceae	Root in wounds [37]	India
<i>Eriospermum abyssinicum</i> Baker. Eriospermaceae	Leaf in wounds, ulcers, abscesses, boils [70]	Africa
<i>Erycibe paniculata</i> Roxb. Convolvulaceae	Bark in Cholera [37]	India, Himalayas, Andaman Islands
<i>Erythrina lysistemon</i> Hutch. Fabaceae	Bark in sores, abscesses, open wounds [88]	South Africa
<i>Erythrina stricta</i> Roxb. Fabaceae	Bark in rheumatism, Asthma, itch, Leprosy and epilepsy [37]	China, India to Vietnam
<i>Erythrina variegata</i> L. Fabaceae	Leaf in burns, wounds [128]; stiffness of joints, pyrexia, bloody amoebiasis [41]	Tropical and subtropical regions
<i>Ethulia conyzoides</i> L.f. Asteraceae	Stomach troubles; leaf on wounds, sprains, fractures [37]	Asia, Africa
<i>Eucalyptus camaldulensis</i> Dehnh. Myrtaceae	Oil in dysentery, diarrhoea, throat relax, dentistry [37]; bark in pimples [88]	Australia
<i>Eucalyptus globules</i> Labill. Myrtaceae	Oil of leaf antiseptic, expectorant, febrifuge, respiratory diseases [37]	Australia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Euclea divinorum</i> Hiern. Ebenaceae	Root and leaf in skin rash, bleeding wounds [42]	Africa, Comoro islands, Arabia
<i>Eugenia uniflora</i> L. Myrtaceae	Leaf in skin infections, other microbial infections [129]	East coast of south America
<i>Eulophia campestris</i> Wall. Orchidaceae	Rhizome as tonic, aphrodisiac; in heart troubles, stomatitis, purulent cough [37]	Indian subcontinent, Africa
<i>Eulophia nuda</i> Lindl. Orchidaceae	Tubers in tumours, glandular Tuberculosis, bronchitis [37]	India to Malaysia
<i>Eupatorium odoratum</i> L. Asteraceae	Leprosy, haemostatic, cuts, wounds [72, 98]	North America
<i>Euphorbia antiquorum</i> L. Euphorbiaceae	Nervine troubles, dropsy, warts, cutaneous affections [37]	Mexico
<i>Euphorbia barnhartii</i> Croizat. Euphorbiaceae	Leaf poultice on boils [36]	Central Africa
<i>Euphorbia helioscopia</i> L. Euphorbiaceae	Seed in Cholera, juice in rheumatism, neuralgia, warts [37]	Many parts of Europe, Africa, Asia
<i>Euphorbia hirta</i> L. Euphorbiaceae	Cough, asthma, dysentery, genito-urinary diseases; latex in warts [37]; antibacterial [36]	India
<i>Euphorbia nivulia</i> Buch. -Ham Euphorbiaceae	Wounds of animal [36]	India to Myanmar
<i>Euphorbia pilosa</i> L. Euphorbiaceae	Juice in fistular sores [37]; latex wound healing [75]	Central Asia, Himalayan region
<i>Euphorbia thymifolia</i> L. Euphorbiaceae	Leaf stimulant; plant in ringworm [37]	Tropical and subtropical America
<i>Euphorbia trigona</i> Mill. Euphorbiaceae	Leaf poultice on boils [37]	Central Africa

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Excoecaria agallocha</i> L. Euphorbiaceae	Rheumatism, paralysis, Leprosy; leaf and latex on obstinate ulcers [37]	Bangladesh, India, Australia
<i>Fagus sylvatica</i> L. Fabaceae	Yielded creosote analgesic and antiseptic [37]	Many part of Europe
<i>Ferula jaeschkeana</i> Vatke Apiaceae	Latex in wounds and bruises [37]	Himalayan region
<i>Ficus arnottiana</i> (Miq.) Miq. Moraceae	Leaf and bark in cutaneous affections [37]	India, Sri Lanka
<i>Ficus benjamina</i> L. Moraceae	Leaf in oil on ulcers [37]	Asia and Australia
<i>Ficus benghalensis</i> L. Moraceae	Vaginal infections, nasal bleeding, obesity, dysmenorrhoea, spot on skin, tooth ache [41]	Indian subcontinent
<i>Ficus dalhousiae</i> (Miq.) Miq. Moraceae	Leaf, bark in liver and skin complaints [37]	Western Ghats of India
<i>Ficus natalensis</i> Hochst. Moraceae	Leaf in Wounds, boils, warts and growths [88]	African countries
<i>Ficus palmate</i> Forssk. Moraceae	Fruit in lungs and blooder diseases [37]	Nepal to Egypt via Arabian countries
<i>Ficus racemosa</i> L. Moraceae	Cuts and wounds [130]	South and south east Asia, Australia
<i>Ficus religiosa</i> L. Moraceae	Bark in ulcers and skin troubles [37]; burn wound, ear and vaginal infection [41]	Indian subcontinent, China
<i>Ficus retusa</i> L. Moraceae	Adventitious root on painful tooth, root bark and leaf boiled in oil on wounds [37]	Malaysia
<i>Ficus sur</i> Forssk. Moraceae	Bark in boils [88]	African countries

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Ficus talbotii</i> King. Moraceae	Bark in ulcers, venereal diseases, diarrhoea, Leprosy [37]	India, Sri Lanka, China
<i>Fleurya interrupta</i> (L.) Gaudich. Urticaceae	Root diuretic, leaf on carbuncles [37]	China, India to Malaysia
<i>Floscopa scandens</i> Lour. Commelinaceae	Fractured bone; stem juice in eye sore [37]	India to Malaysia
<i>Fluggea leucopyrus</i> Willd. Euphorbiaceae	Leaf on sores [65]	Widespread in Asia, Africa
<i>Forsythia suspensa</i> (Thunb.) Vahl. Oleaceae	Fruit, bud antimicrobial [131]	Asia
<i>Fritillaria cirrhosa</i> D.Don. Liliaceae	Corns in asthma, bronchitis, Tuberculosis [37]	China, Indian subcontinent, Myanmar
<i>Fumaria officinalis</i> L. Papaveraceae	Leprosy, wound healing, antiseptic, disinfectant [132]	Western and Central Europe
<i>Fumaria vaillantii</i> Loisel. Papaveraceae	Diuretic, in scrofulous skin affections [37]	Almost global distribution in hilly areas
<i>Galenia africana</i> L. Aizoaceae	Plant in wounds [80]	South-western part of Africa
<i>Galeopsis tetrahit</i> L. Lamiaceae	Infusion in pulmonary troubles [37]	Europe and north-western Asia
<i>Galium verum</i> L. Rubiaceae	Urinary diseases, juice in epilepsy, cutaneous troubles [37]	Europe, north Africa, temperate Asia
<i>Garcinia mangostana</i> L. Clusiaceae	Diarrhoea, dysentery, cutaneous affections [37]	Indonesia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Garcinia morella</i> (Gaertn.) Desr. Clusiaceae	Gum-resin in dropsical affections [37]; wound healing [46]	India, Sri Lanka, Philippines
<i>Gardenia resinifera</i> Roth. Rubiaceae	Plant antiseptic, hepatoprotective, antirheumatic [45]	Tropical Africa, Asia, Pacific islands
<i>Gardenia turgida</i> Roxb. Rubiaceae	Fruits in affections of mammary gland [37]	India to Myanmar, China
<i>Gaultheria fragrantissima</i> Wall. Ericaceae	Oil stimulant, rheumatism, neuralgia, antiseptic [37]	China, India to Malaysia
<i>Gaultheria procumbens</i> L. Ericaceae	Oil is antirheumatic, antiseptic [37]	North-eastern North America
<i>Gentiana kurroo</i> Royle. Gentianaceae	Tonic, febrifuge, urinary troubles [37]	Terrestrial
<i>Geranium nepalense</i> Sweet. Geraniaceae	Renal diseases [37]	Asia
<i>Geranium robertianum</i> L. Geraniaceae	Malaria like fever, urinary stone, jaundice, diarrhoea, haemorrhage [37]	Europe, Asia, North America, Africa
<i>Geranium wallichianum</i> Oliv. Geraniaceae	Tooth ache and eye troubles [37]	Himalayan region
<i>Glinus oppositifolius</i> (L.) Aug. DC. Molluginaceae	Antiseptic, juice in skin troubles [37]	Pantropical
<i>Globba marantina</i> L. Zingiberaceae	Root tuber in Leukoderma [65]	South and southeast Asia
<i>Gloriosa superba</i> L. Colchicaceae	Tuber tonic, to promote labour pain, in neuralgic pain, skin troubles [37]	Part of Africa, Asia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Glycosmis pentaphylla</i> (Retz.) DC. Rutaceae	Leaf in fever, liver complaints, eczema and other skin troubles [37]	Southeast Asia, northern Australia
<i>Glycyrrhiza glabra</i> L. Fabaceae	Rhizomes and roots tonic, catarrhal affections, urinary problems [37]; antiseptic [36]	Southern Europe, parts of Asia
<i>Glycyrrhiza uralensis</i> Fisch. ex DC. Fabaceae	Root antimicrobial [133]	Asia
<i>Gmelina asiatica</i> L. Verbenaceae	Root in rheumatism, catarrh of the bladder; wood and stem in fevers [37]	South and southeast Asia
<i>Gnidia kraussiana</i> Meisn. Thymelaeaceae	Root in burns, Small pox, boils [80, 88]	African countries
<i>Gomphostemma lucidum</i> Wallich ex Benth. Lamiaceae	Root in pneumonia [37]	India, Laos, Myanmar to Vietnam
<i>Gouania tiliaefolia</i> Lam. Rhamnaceae	Pulp in skin complaints [37]	China, India to Malaysia
<i>Graderia scabra</i> Benth. Orobanchaceae	Root on sores on the face [88]	African countries
<i>Graptophyllum pictum</i> (L.) Griff. Acanthaceae	Cuts and skin complaints, leaf on swelling and ulcers [37]	Australasia - New Guinea
<i>Grewia occidentalis</i> L. Malvaceae	Bark to dress wounds [80,88]	Southern Africa
<i>Grewia tenax</i> Frosk. Malvaceae	Wound healing [101]	Dry Africa, Arabia to India
<i>Guettarda speciose</i> L. Rubiaceae	Bark in chronic dysentery, wounds and abscesses [37]	Eastern Africa, tropical Asia, Australia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Guiera senegalensis</i> J.F. Gmel Combretaceae	Stem bark and leaf in skin diseases [73]	Savanna zone of Africa
<i>Gunnera perpensa</i> L. Gunneraceae	Root in dressing of wounds; psoriasis [88]	Eastern Africa
<i>Gundelia tournefortii</i> L. Asteraceae	Leaf and root antimicrobial [67]	Eastern Mediterranean, Middle East
<i>Gymnema acuminatum</i> Wall. Apocynaceae	Leaf on sores [37]	South east Asian countries
<i>Gymnopetalum cochinchinense</i> (Lour.) Kurz. Cucurbitaceae	Leaf as anti-tetanus after miscarriage, in ophthalmia [37]	China, India to Malaysia
<i>Gymnostachyum febrifugum</i> Benth. Acanthaceae	Root febrifuge, on blisters and sores on the tongue [37]	Western Ghats of India
<i>Gynocardia odorata</i> R.Br. Achariaceae	Bark febrifuge, seeds in skin ailments [37]	Mountain valley forest of South Asia
<i>Gynura aurantiaca</i> (Blume) DC. Asteraceae	Leaf in ringworm [37]	Southeast Asia
<i>Gynura pseudochina</i> (L.) DC. Asteraceae	Root in parturient women, leaf on pimples, herb in erysipelas, breast tumours [37]	China, India to Myanmar, tropical Africa
<i>Haemanthus coccineus</i> L. Amaryllidaceae	Leaf antiseptic for wounds and ulcers [70]	Southern Africa
<i>Haemanthus multiflorus</i> Martyn. Amaryllidaceae	Plant on wounds and ulcers [37]	Sub-Saharan Africa to Arab
<i>Haldinia cordifolia</i> (Roxb.) Ridsdale. Rubiaceae	Leaf on wounds and boils [134]	Southern Asia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Halleria lucida</i> L. Stilbaceae	Plant in skin complaints [88]	Southern Africa
<i>Harpagophytum procumbens</i> DC. ex Meisn. Pedaliaceae	Root on sores, ulcers, boils [80]	Southern Africa
<i>Harpephyllum caffrum</i> Bernh. ex Krauss Anacardiaceae	Bark in acne and eczema [79]	Southern Africa
<i>Hedyotis auricularia</i> L. Rubiaceae	Diarrhoea, dysentery, colitis, Cholera; leaf on wounds [37]	South east Asia, Australia
<i>Hedyotis diffusa</i> Willd. Rubiaceae	Tonic, fever, Gonorrhoea; mouthwash in tooth ache [37]	China, Japan, Nepal
<i>Hedyotis glabra</i> R.Br. ex Wall. Rubiaceae	With ginger and salt on incipient ulcers [37]	Tropical Asia, Pacific islands
<i>Hedyotis umbellata</i> (L.) Lam. Rubiaceae	Leaf and root in asthma, bronchitis [37]	Peninsular India, Sri Lanka
<i>Helichrysum foetidum</i> Moench. Asteraceae	Leaf on septic sores [80,88]	Some African countries
<i>Heliotropium curassavicum</i> L. Boraginaceae	Root on sores and wounds [37]	America
<i>Heliotropium eichwaldii</i> Steud. Boraginaceae	Leaf on ulcers and warts [37]	Russia to India
<i>Heliotropium indicum</i> L. Boraginaceae	Diuretic, ulcers, sores, wounds, gum boils, skin affections [37]	Asia
<i>Heliotropium ovalifolium</i> Forssk. Boraginaceae	Syphilitic ulcers [37]	India to Myanmar, Africa, Australia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Heliotropium strigosum</i> Willd. Boraginaceae	Diuretic, sore eyes, boils, wounds and ulcers [37]	Tropical Africa, Arabia, Asia, Australia
<i>Heliotropium tuberosum</i> (Boiss.) Boiss. Boraginaceae	Gonorrhea, eye trouble of camels [37]	Africa
<i>Helminthostachys zeylanica</i> (L.) Hook. Ophioglossaceae	Rhizomes in dysentery, whooping cough, catarrh, Phthisis [37]	China, India to Malaysia, Australia
<i>Hemidesmus indicus</i> (L.) R.Br. Apocynaceae	Root in rheumatism, urinary diseases, skin problems [37]	South Asia
<i>Hemionitis arifolia</i> (Burm. f.) T. Moore Pteridaceae	Frond juice on burns [37]	Tropical Asia
<i>Herniaria glabra</i> L. Caryophyllaceae	Diuretic, catarrhal affections of the bladder [37]	North America and Europe
<i>Herniaria hirsute</i> L. Caryophyllaceae	Diuretic, sore throat [37]	Eurasia, north Africa
<i>Hesperethusa crenulata</i> (Roxb.) M. Roem. Rutaceae	Fruit in malignant and persistent fever [37]	China, south and southeast Asia
<i>Heterophragma quadriloculare</i> (Roxb.) K. Schum. Bignoniaceae	Wood tar in cutaneous diseases [37]	Peninsular India
<i>Heynea trijuga</i> Roxb. Meliaceae	Leaf decoction in Cholera [37]	China, India to Indonesia
<i>Hibiscus mutabilis</i> L. Malvaceae	Leaf in cough, menorrhagia, dysuria, burn wounds, scalds [37]	China, Japan

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Hibiscus surattensis</i> L. Malvaceae	Leaf and stalk in Inflammation, sores, skin irritation [37]	Africa and Asia
<i>Hibiscus trionum</i> L. Malvaceae	Flowers diuretic, in skin troubles [37]	Tropical and subtropical regions
<i>Hiptage benghalensis</i> (L.) Kurz. Malpighiaceae	Vine in chronic rheumatism and asthma, leaf in cutaneous diseases [37]	India, southeast Asia, Philippines
<i>Hoffmannseggia burchellii</i> (DC.) Oliv. Fabaceae	Root in wounds [70]	Southern Africa
<i>Holarrhena antidysenterica</i> (Linn.) Wall. Apocynaceae	Bark in amoebic dysentery, tonic, febrifuge, Tuberculosis [36]	Tropical Asian countries
<i>Holoptelea integrifolia</i> (Roxb.) Planch. Ulmaceae	Bark and leaf antimicrobial [40]	East Asia
<i>Hornstedtia costata</i> (Roxb.) K. Schum. Zingiberaceae	Seed in stomach ailments, debility, Asthma, pulmonary affections [37]	Southeast Asia, Himalayan region
<i>Houttuynia cordata</i> Thunb. Saururaceae	Leaf in Measles, dysentery, Gonorrhoea, eye and skin troubles [37]	Japan, Korea, China, southeast Asia
<i>Humboldtia vahliana</i> Wight Fabaceae	Bark in epilepsy, Leprosy, ulcers [37]	Western Ghats, India
<i>Humulus lupulus</i> L. Cannabinaceae	Antiseptic [44]; hop substance anti-bacterial [37]	Europe, western Asia, North America
<i>Hunteria zeylanica</i> (Retz.) Gardner ex Thwaites. Apocynaceae	Leaf in wounds and cuts [37]	Parts of Africa, China, India to Malaysia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Hura crepitans</i> L. Euphorbiaceae	Latex, bark and seeds in Leprosy [37]	Tropical Americas
<i>Hybanthus enneaspermus</i> (L.) F. Muell. Violaceae	Tonic; root in urinary affections [37]	India, China, Africa, Australia
<i>Hydnocarpus castanea</i> Hook.f. & Thomson. Achariaceae	Bark in cutaneous diseases [37]	Thailand, Malaysia, Indonesia
<i>Hydnocarpus kurzii</i> (King) Warb. Achariaceae	Seed oil on Leprosy [37]; antiseptic [36]	India to Myanmar
<i>Hydnocarpus laurifolia</i> (Den) Sleummer Achariaceae	Seed oil in Leprosy, Tuberculosis, chronic skin infections, ophthalmia, wounds, ulcers [37]	South east Asia
<i>Hydrastis Canadensis</i> L. Ranunculaceae	Root antimicrobial [135]	South-eastern Canada, eastern USA
<i>Hydrocotyle javanica</i> Thunb. Apiaceae	Tonic, diuretic, dysentery, cutaneous diseases [37]	Tropical Asia
<i>Hydrocotyle sibthorpioides</i> Lam. Araliaceae	Rheumatism, diuretic, pulmonary, cutaneous troubles; root in liver complaints; leaf on boils [37]	South-eastern Asia
<i>Hydrolea zeylanica</i> (L.) Vahl. Hydroleaceae	Leaf antiseptic, applied on ulcers [37]	Pantropical
<i>Hygrophila auriculata</i> (Schumach.) Heine. Acanthaceae	Jaundice, rheumatism, uro-genital diseases; seed in venereal diseases [36]; anemia, edema, insomnia, gall stone, Herpes, hemostasis [41]	Tropical Asia, Africa
<i>Hygrophila quadrivalvis</i> (Buch Ham.) Nees. Acanthaceae	Leaf in wounds and tooth ache [37]	South and south east Asia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Hypericum calycinum</i> L. Hypericaceae	Bacterial disease [136]	Mediterranean area
<i>Hypericum hookerianum</i> Wight & Arn. Hypericaceae	Leaf and stem for wound healing [137]	Himalayan region
<i>Hypericum humifusum</i> L. Hypericaceae	Flower in olive oil or alcohol in old ulcers and eczema [37]	Western Europe
<i>Hypericum perforatum</i> L. Hypericaceae	Expectorant, pulmonary, urinary troubles; flowers in olive oil on wounds, sores, ulcers [37]	Parts of Europe and Asia
<i>Hypericum sampsonii</i> Hance. Hypericaceae	For wound healing [37]	China, Japan, India
<i>Hypochaeris glabra</i> L. Asteraceae	Root tonic, diuretic; fresh herb wound healing [37]	Europe, North Africa, Middle East
<i>Hyptis brevipes</i> Poit. Lamiaceae	Decoction after parturition, leaf for healing of naval cord [37]	Pantropical
<i>Hyptis capitata</i> Jacq. Lamiaceae	Tonic, root in amenorrhoea, leaf wound healing [37]	America, West Indies
<i>Hyptis suaveolens</i> (L.) Poit. Lamiaceae	Stimulant, galactagogue, catarrhal conditions, uterus affections [37]	Pantropical
<i>Hyssopus officinalis</i> L. Lamiaceae	Stimulant, nervous disorders; pulmonary, urinary and uterine troubles; vulnerary [37]	Mediterranean regions
<i>Ichnocarpus frutescens</i> (L) W.T. Aiton. Apocynaceae	Rheumatism, Asthma, Cholera, fever [138]	India, China, southeast Asia, Australia
<i>Ilex mitis</i> (L.) Radlk. Aquifoliaceae	Bark in skin rash, sores on the face [37]	Southern Africa
<i>Impatiens chinensis</i> L. Balsaminaceae	Gonorrhoea; in burns [37]	India, Myanmar to Vietnam

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Indigofera aspalathoides</i> DC. Fabaceae	Aerial parts in cutaneous affections, Leprosy [37]	South India, Sri Lanka
<i>Indigofera enneaphylla</i> L. Fabaceae	Juice diuretic, chronic venereal diseases [37]	India to Malesia, Australia, Africa
<i>Indigofera suffruticosa</i> Mill. Fabaceae	Febrifuge; in Syphilis, epilepsy; root and seed in urinary diseases and ulcers [37]	Subtropical and tropical Americas
<i>Indigofera tinctoria</i> L. Fabaceae	Gonorrhoea, urinary complaints, hepatitis, sores, old ulcers, piles [37]	Asia, parts of Africa
<i>Inula racemosa</i> Hook.f. Asteraceae	General infectious diseases, antiseptic, disinfectant [95]	Himalayan region
<i>Ipomoea crassipes</i> Hook. Convolvulaceae	Whole plant in sores [88]	Southern Africa
<i>Ipomoea eriocarpa</i> R. Br. Convolvulaceae	Plant boiled in oil in rheumatism, epilepsy, Leprosy, ulcers [37]	Tropical Africa
<i>Ipomoea obscura</i> (L.) Ker Gawl. Convolvulaceae	Toasted plant boiled in ghee in aphthous affections [37]	Parts of Africa, Asia, Pacific islands
<i>Ipomoea pes-tigridis</i> L. Convolvulaceae	Leaf on boils, sores, pimples, carbuncles [37]	Africa, southern and eastern Asia
<i>Ipomoea purpurea</i> (L.) Roth. Convolvulaceae	Used as anti-syphilitic [37]	New world tropics
<i>Ipomoea quamoclit</i> L. Convolvulaceae	Leaf on haemorrhoids, carbuncles [37]	New world tropics
<i>Ipomoea tuberculata</i> Ker Gawl. Convolvulaceae	Seed as antidote of hydrophobia [37]	Africa and Asia
<i>Iris versicolor</i> L. Iridaceae	Root and rhizome antimicrobial [139]	North America, eastern Canada

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Isatis tinctorial</i> L. Brassicaceae	Plant in ulcers [37]	Caucasus to Siberia and western Asia
<i>Ixora chinensis</i> Lam. Rubiaceae	Flower in Tuberculosis, haemorrhages; plant in urinary troubles, root fed after parturition [37]	Myanmar, Thailand, Vietnam, Malaysia
<i>Ixora coccinea</i> L. Rubiaceae	Root astringent, antiseptic; diarrhoea, dysentery, sores, chronic ulcers; flower in dysentery, catarrhal bronchitis, eye troubles, as vulnerary [37]	Southern India, Sri Lanka
<i>Jacaranda acutifolia</i> Humb. & Bonpl. Bignoniaceae	Bark and leaf in Syphilis, Gonorrhoea; leaf vulnerary, pectoral [37]	Part of South America
<i>Jasminum fluminense</i> Vell. Oleaceae	Leaf and young shoot in ulcers and boils [70]	Some African countries
<i>Jasminum grandiflorum</i> L. Oleaceae	Leaf antimicrobial [66]	South Asia, Arab, China
<i>Jasminum humile</i> L. Oleaceae	Root dye in ringworm, bark juice in sinuses and fistulae [37]	Himalayan regions
<i>Jasminum multiflorum</i> (Burm. f.) Andrew. Oleaceae	Leaf in indolent ulcers [37]	India to Vietnam
<i>Jateorhiza palmate</i> (Lam.) Miers. Menispermaceae	Root in sores [37]	East Africa
<i>Jatropha curcas</i> L. Euphorbiaceae	Eczema and ringworm [37]; wounds and boils [88]	Tropical Americas
<i>Jatropha gossypifolia</i> L. Euphorbiaceae	Leaf febrifuge; root in Leprosy; latex in ulcers [37]	Mexico, South America, India
<i>Jatropha multifida</i> L. Euphorbiaceae	Leaf in Scabies; seed in fever, venereal diseases [37]	Trinidad, Cuba, Southern USA, Mexico

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Jatropha zeyheri</i> Sond. Euphorbiaceae	Rhizomes or juice in wounds, boils, sores, burns [80, 88]	Some African countries
<i>Juniperus communis</i> L. Cupressaceae	Fruits and essential oil stimulant, diuretic; diseases of uro-genital tract, skin [37]	Temperate Northern Hemisphere
<i>Jussiaea repens</i> L. Onagraceae	Constituent of ointment for ulcers and skin problems [37]	Asia, Australia, Africa
<i>Jussiaea tenella</i> Burm.f. Onagraceae	Root in Syphilis, plant in pimples [37]	Tropical Africa, tropical America
<i>Justicia tranquebariensis</i> L.f. Acanthaceae	Leaf juice to children in Smallpox; contusions [37]	Peninsular India
<i>Kaempferia galangal</i> L. Zingiberaceae	Rhizomes stimulant, expectorant, diuretic; in cough and pectoral affections [37]	China, India to Myanmar
<i>Kaempferia rotunda</i> L. Zingiberaceae	Rhizome to remove clots and pus, tuber in tumours and wounds [37]	China, Indian subcontinent
<i>Kalanchoe laciniata</i> (L.) DC. Crassulaceae	Leaf styptic, antiseptic; diarrhoea, dysentery, lithiasis, Phthisis [37]	Africa, through Arab to east Asia
<i>Kalanchoe petitiiana</i> A. Rich. Crassulaceae	Leaf in eye diseases [140]	Madagascar and tropical Africa
<i>Kigelia africana</i> (Lam.) Benth. Bignoniaceae	Fruit in syphilitic sores; bark in rheumatism, dysentery, venereal diseases [37]	Tropical Africa
<i>Krameria triandra</i> Ruiz & Pav. Krameriaceae	Astringent, tonic, diarrhea, hemorrhage, menstrual and urinary complaints, sore throat [37]	South America
<i>Lagerstroemia indica</i> (L.) Pers. Lythraceae	Bark stimulant, febrifuge; fruit in aphthae of mouth [37]	China, Korea, Japan, Indian subcontinent
<i>Lannea edulis</i> Engl. Anacardiaceae	Bark in boils and abscesses [80, 88]	Some African countries

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Lantana aculeata</i> L. Verbenaceae	Plant vulnerary; in fistula, pustules, tumours, Tetanus [37]	Central and South America
<i>Lantana rugosa</i> Thunb. Verbenaceae	Leaf, stem and ripe fruits in festering sores, cuts [88]	Some African countries
<i>Larrea tridentate</i> (DC.) Coville. Zygophyllaceae	Leaf in skin infections [141]	Mexico, parts of USA
<i>Lavandula angustifolia</i> Mill. Lamiaceae	Flower oil antimicrobial [142]	Mediterranean regions
<i>Lavandula pubescens</i> Decne. Lamiaceae	Essential oil antimicrobial [143]	Arabian Peninsula
<i>Lawsonia inermis</i> L. Lythraceae	Leaf in boil, burn, skin diseases, sore throat [36]	Parts of Africa, Australasia
<i>Leea aequata</i> L. Vitaceae	Anti-tubercular activity [37]	India to Malaysia
<i>Leea macrophylla</i> Roxb. ex Hornem. Vitaceae	Tubers in wounds, sores and ringworm [37]	South and south east Asia
<i>Lemna minor</i> L. Lemnaceae	Plant in cutaneous disorders [144]	Worldwide
<i>Leonotis leonurus</i> (L.) R.Br. Lamiaceae	Leaves and stems in boils, eczema, itching and other skin diseases [37]	Southern Africa
<i>Leonotis nepetifolia</i> (L.) R.Br. Lamiaceae	Plant in skin affections; flower ash on burns and scalds; leaf in rheumatism [37]	Tropical Africa, southern India
<i>Leontonyx angustifolius</i> DC. Lamiaceae	Plant in ulcers [80]	Mediterranean region

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Leonurus sibiricus</i> L. Lamiaceae	Tonic, vulnerary, menstrual disorders; leaf and root febrifuge [37]	China, Japan, Korea, Siberia
<i>Lepidium iberis</i> L. Brassicaceae	Seed in bronchitis [37]	Himalayan region, southern Europe
<i>Lepidium latifolium</i> L. Brassicaceae	Hepatic and renal troubles, skin affections [37]	Europe, north Africa, west Asia
<i>Lepidium sativum</i> L. Brassicaceae	Leaf diuretic, hepatic complaints; seed diuretic, tonic, in sprains; roots in Syphilis [37]	England, France, Netherlands, Scandinavia
<i>Leptadenia reticulata</i> (Retz.) Wight. Asclepiadaceae	Stimulant; leaf and root in skin affections, habitual abortion [37]	India to Malaysia
<i>Leucas aspera</i> (Willd.) Link. Lamiaceae	Antipyretic, Psoriasis, chronic skin eruptions; flowers in coughs and colds [37]	India and the Philippines
<i>Leucas lavandulaefolia</i> Willd. Lamiaceae	Fresh leaf to old sores and dermatosis [37]	Indian subcontinent
<i>Leucas zeylanica</i> (L) R. Br. Lamiaceae	Antipyretic, in skin troubles; decoction in ulcer of nose [37]	Tropical Asia and Malaysia
<i>Licuala spinose</i> Roxb. Arecaceae	Bark in treatment of Tuberculosis [37]	China to Malaysia
<i>Lilium candidum</i> L. Liliaceae	Bulb in tumours, ulcers and skin inflammations [37]	Balkans and Middle East
<i>Lilium giganteum</i> Wallich. Liliaceae	Leaf in wounds and bruises [37]	Himalayan region
<i>Limnophila aromatica</i> (Lam.) Merr. Plantaginaceae	Antiseptic, febrifuge, given to nursing mothers [37]	Tropical and subtropical Asia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Limnophila indica</i> (L.) Druce. Plantaginaceae	Antiseptic, leaf in dyspepsia and dysentery [37]	Pantropical
<i>Lindenbergia indica</i> (L.) Vatke. Orobanchaceae	Chronic bronchitis, skin eruptions [37]	India to west Asia
<i>Lindernia crustacea</i> (L.) F. Muell. Linderniaceae	Dysentery, boils, sores, itch and ringworm [37]	Tropical and subtropical areas
<i>Lindernia pyxidaria</i> L. Linderniaceae	Gonorrhoea [37]	Terrestrial
<i>Lippia adoensis</i> Hochst. ex Walp. Verbenaceae	Leaf in various skin diseases [145]	Africa, South and Central America
<i>Lippia javanica</i> Spreng. Verbenaceae	Leaf and root in skin diseases [88]	Many parts of Africa
<i>Liquidambar orientalis</i> Mill. Hamamelidaceae	Stimulant, expectorant, antiseptic [37]	Western Asia
<i>Lithospermum officinale</i> L. Boraginaceae	Root in Smallpox, Measles, itches; seed diuretic, blooder diseases [37]	Europe, Iran, the Caucasus
<i>Litsea lancifolia</i> Hook.f. Lauraceae	Bark in sprains and bruises [37]	Bhutan, India to Vietnam
<i>Lobaria pulmonaria</i> L. (Hoffm.) Lobariaceae	Plant in eczema [37]	Europe, Asia, North America, Africa
<i>Lobelia inflates</i> L. Campanulaceae	Asthma and bronchitis [37]	Eastern North America
<i>Lobelia nicotianifolia</i> L. Campanulaceae	Used as antiseptic [37]	India and Sri Lanka.

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Lobelia cardinalis</i> L. Campanulaceae	Root and flower antimicrobial [146]	Americas
<i>Lobostemon fruticosus</i> H. Buek. Boraginaceae	Leaf and twig in wounds, skin diseases [80]	Some African countries
<i>Lonicera glauca</i> Hook. Fil. & Thomson Caprifoliaceae	Leaf and flower in venereal diseases [37]	Southwest Asia, Iran to Kashmir valley
<i>Luffa acutangula</i> (L.) Roxb. Cucurbitaceae	Leaf in haemorrhoids, Leprosy, spleenitis, conjunctivitis, uraemia, amenorrhoea [37]	Asia
<i>Luffa acutangula</i> (L.) <i>var amara</i> (Roxb.) Cucurbitaceae	Diuretic, in asthma, skin troubles, splenic enlargement; seed expectorant, fruit in jaundice [37]	India
<i>Luffa cylindrica</i> M. Roem. Cucurbitaceae	Aerial part in Leprosy [44, 98]	South and Southeast Asia
<i>Luffa echinata</i> Roxb. Cucurbitaceae	Fruits in dropsy, nephritis, chronic bronchitis, lung complaints [37]	Indian subcontinent, Africa
<i>Lupinus varius</i> L. Fabaceae	Seed and flower antimicrobial [67]	Part of Africa, Europe
<i>Luisia tenuifolia</i> Blume. Orchidaceae	Boils, abscesses, tumours [37]	Tropical Asia
<i>Lumnitzera racemosa</i> Willd. Combretaceae	Stem juice in itches and Herpes [37]	East Africa, east Asia
<i>Lychnis coronaria</i> (L.) Desr. Caryophyllaceae	Root in liver and lung complaints, infraction of mesenteric lymph glands [37]	Asia and Europe
<i>Lycopodium clavatum</i> L. Lycopodiaceae	Problems of skin, liver, kidney, urinary tract, general infections, gout [96]	Pantropic

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Lycoris aurea</i> Herb. Amaryllidaceae	Bulbs in burns in Chinese medicine [37]	China, Japan
<i>Lygodium flexulosum</i> (L.) Sw. Lygodiaceae	Root as expectorant, rheumatism, sprains, eczema, wounds, carbuncles [37]	China, India to Malaysia, Australia
<i>Lygodium microphyllum</i> (Cav.) R.Br. Lygodiaceae	Leaf in dysentery, skin diseases [37]	Tropical Africa, South East Asia, Australia
<i>Lyonia ovalifolia</i> (Wall.) Drude. Ericaceae	Leaf and buds in cutaneous troubles [37]	China, Nepal to Malaysia
<i>Macaranga peltata</i> Roxb. Muell. Euphorbiaceae	Veneral sores, leaf and bark vulnerary [37]	Thailand, Sri Lanka, India
<i>Macaranga pustulata</i> King ex Hook.f. Euphorbiaceae	Bark and leaf in cuts, wounds [72]	China, India to Malaysia
<i>Machilus macrantha</i> Nees. Lauraceae	Bark in asthma, rheumatism; leaf to ulcers [37]	Western Ghats of India, Sri Lanka
<i>Madhuca longifolia</i> (J. König.) J.F. Macbr. Sapotaceae	Oil in skin affections [37]; antiseptic, used in skin diseases [36]	India, Sri Lanka, Nepal, Myanmar
<i>Maerua crassifolia</i> Forssk. Capparaceae	Leaf antimicrobial [66]	Africa, tropical Arabia, Israel
<i>Maesa ramentacea</i> (Roxb.) A. DC. Primulaceae	Leaf in itches, skin affections [37]	India to Malaysia
<i>Mallotus philippensis</i> (Lam.) Muell. Arg. Euphorbiaceae	Fruit in skin diseases like ringworm, scabies [36]	South east Asia, Australia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Malva parviflora</i> L. Malvaceae	Seed in cough, ulcer of the bladder [37]; septic wounds, inflammation [80]	Northern Africa, Europe, Asia
<i>Malva sylvestris</i> L. Malvaceae	Pulmonary and urinary affections, inflammations, abscesses; flowers as gargle [37]	Western Europe, North Africa, Asia
<i>Mandragora autumnalis</i> Bertol. Solanaceae	Fruit antimicrobial [67]	Mediterranean region
<i>Mangifera indica</i> L. Anacardiaceae	Bark, leaf, unripe food antimicrobial [40]; Internal part of seed of immature fruit in alopecia and early ripening of hair, dust of new leaves in diabetes and leaves burned in covered condition on burn wounds [41]	Indian subcontinent
<i>Marrubium vulgare</i> L. Lamiaceae	Leaf, flowering tops in cough, cold, pulmonary affections [37]	Europe, northern Africa, part of Asia
<i>Marsilea minuta</i> L. Marsileaceae	Leaf juice in Asthma, dementia, insomnia, high blood pressure, epilepsy etc. [41]	Tropical and subtropical countries
<i>Martynia annua</i> L. Martyniaceae	Leaf in glandular Tuberculosis, gargle in sore throat, fruit in inflammation [37]	Tropical America, Indian subcontinent
<i>Matricaria chamomilla</i> L. Asteraceae	Expectorant, diuretic, neuralgia, debility, intermittent fever, eczema, bruises, sores, piles [37]	Europe, temperate Asia
<i>Melaleuca leucadendron</i> L. Myrtaceae	Oil expectorant, chronic laryngitis, bronchitis [37]	Northern Australia, southeast Asia
<i>Melastoma malabathricum</i> L. Melastomataceae	Bark and leaves in skin troubles [37]	Japan, India to Malaysia
<i>Melia azedarach</i> L. Meliaceae	Leaf, flower, bark, root in eczema and various skin diseases [80,88]	India to Malaysia, Australia
<i>Melianthus comosus</i> Vahl. Melianthaceae	Leaf and stem in slow healing wounds, leaf in sores and bruises [37]	Southern Africa

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Melianthus major</i> L. Melianthaceae	Leaf in foul ulcers, gargle in sore throat, gum troubles [37]	South Africa
<i>Melissa officinalis</i> L. Lamiaceae	Leaf antimicrobial [54]	Part of Europe, Asia, Mediterranean Basin
<i>Melissa parviflora</i> Benth. Lamiaceae	Antitubercular, antipyretic; fruit as brain tonic [37]	Bhutan, Nepal, India to Vietnam
<i>Melothria indica</i> Lour. Cucurbitaceae	Leaf in thrush and eye troubles [37]	China, India to Malaysia
<i>Menyanthes trifoliata</i> L. Menyanthaceae	Tonic, febrifuge, skin affections [37]	Asia, Europe, North America
<i>Meriandra bengalensis</i> (J. Koenig ex Roxb.) Benth. Lamiaceae	Tonic, antiseptic; sore throat, aphthae [37]	Ethiopia, Saudi Arabia, India
<i>Meriandra strobilifera</i> Benth. Lamiaceae	Leaf in ulcers and skin abrasions [37]	Western Himalayas of India
<i>Merremia mammosa</i> (Lour.) Hallier f. Convolvulaceae	Tuber in diabetes, affection of throat and respiratory organs [37]	Southeast Asia
<i>Merremia umbellate</i> (L.) Hallier f. Convolvulaceae	Fistula, pustule, tumours, burns, scalds, sores; seed in cutaneous diseases [37]	Tropical and subtropical Africa, Asia
<i>Microglossa pyrifolia</i> (Lam.) Kuntze. Asteraceae	Root in cataract; leaf in yellow fever, Malaria, dropsy, eye sores, ringworm of scalp [37]	India to Malaysia, Africa
<i>Micromelum integerrimum</i> (Buch. -Ham.) ex Roem. Asteraceae	Bark of stem and root in Tuberculosis [37]	Nepal, India to Myanmar
<i>Micromelum pubescens</i> (Burm.f.) B.L. Rob. Asteraceae	Leaf in cuts and wounds [32]	East Africa

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Mikania cordata</i> (Burm.f.) B.L.Rob. Asteraceae	Leaf in wounds [37]	East Africa, tropical East Asia
<i>Mikania scandens</i> (L.) Willd. Asteraceae	Leaf in wound healing [16, 147]	Part of United States, southern Asia
<i>Mimosa pudica</i> L. Fabaceae	Root in urinary complaints, leaf in sinus, sores and piles [37]	South and central America
<i>Mirabilis jalapa</i> L. Nyctaginaceae	Leaf as tonic in China; boils, abscesses, wounds and bruises [37]	Tropical south America
<i>Moghania macrophylla</i> (Willd.) Kuntze. Fabaceae	Root in medicine of ulcers and swellings [37]	Asia
<i>Mollugo cerviana</i> (L.) Ser. Molluginaceae	Plant antiseptic, flowers and tender shoots febrifuge [37]	Part of Europe, Africa, Asia, Australia
<i>Mollugo pentaphylla</i> L. Molluginaceae	Antiseptic, in sore legs [37]	Pantropical
<i>Momordica balsamina</i> L. Cucurbitaceae	Fruit and seed in burns [88]	Tropical Africa
<i>Momordica cochinchinensis</i> (Lour.) Spreng. Cucurbitaceae	Seed in ulcers; fruit and leaf in fracture and ulcers [37]	China, India, Malaysia
<i>Momordica dioica</i> Roxb. ex Willd. Cucurbitaceae	Root in piles, bowel affections, urinary complaints [37]	Pakistan, India, Sri Lanka
<i>Moringa oleifera</i> Lam. Moringaceae	Seed and leaf in Leprosy, cuts, wounds, snake and dog bite wounds [44, 32]; old leaf in high blood pressure, root cover in fungal infection [41]	South Asia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Morus alba</i> L. Moraceae	Leaf in wound healing, antiseptic and disinfectant [47]	Northern China
<i>Morus laevigata</i> Wall. ex Brandi. Moraceae	Juice of the plant on sores [37]	Tibet, Himalayas, Indochina
<i>Mucuna monosperma</i> Wight. Fabaceae	Seed in asthma, coughs and tongue infections [37]	India to Malaysia
<i>Mucuna pruriens</i> (L) Dc. Fabaceae	Frozen shoulder, atrophy of muscle, sex stimulant, bleeding from natural orifices [41]	Africa and tropical Asia
<i>Murraya paniculate</i> (L.) Jack. Rutaceae	Leaf in diarrhea, dysentery, wounds; leaf and root bark in cough, rheumatism, hysteria [37]	China, Indian sub-continent, Australia
<i>Mussaenda frondosa</i> L. Rubiaceae	Shoot in children for cough; root in white Leprosy, eye troubles [37]	India to Malaysia
<i>Mussaenda glabra</i> Vahl. Rubiaceae	Leaf, root in cough; flower diuretic; in asthma, recurrent fevers [37]	Tropical Africa, Asia, Malaysia
<i>Myrica esculenta</i> Buch. - Ham. ex D.Don Myricaceae	Bark antiseptic, diuretic; in asthma, diarrhea, fevers, lung affections, putrid sores [37]	Bhutan, India, Myanmar to Vietnam
<i>Myristica malabarica</i> Lam. Myristicaceae	Seed in indolent ulcers [37]	India
<i>Myrothamnus flabellifolius</i> Welw. Myrothamnaceae	Leaves and twigs in burns and wounds [70,79]	Southern Africa
<i>Myroxylon balsamum</i> (L.) Harms. Fabaceae	Oil antiseptic, stimulant, expectorant [37]	Americas
<i>Myroxylon pereirae</i> Klotzsch. Fabaceae	Antiseptic, in wounds, indolent ulcers; expectorant, ringworm, haemorrhoids [37]	Central and south America

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Myrsine africanab</i> L. Primulaceae	Part of ointment for ringworm and other skin affections [37]	Macaronesia Africa, South Asia
<i>Myrtus communis</i> L. Myrtaceae	Leaf, berries, oil antiseptic; in diseases of respiratory, bladder, stomach, liver; aphthae, internal ulceration [37]	Mediterranean region in southern Europe
<i>Nardostachys jatamansi</i> (D.Don) DC. Caprifoliaceae	Rhizome tonic, stimulant, in Leprosy [37]	Eastern Himalayas
<i>Naregamia alata</i> Wight & Arn. Meliaceae	Root in chronic bronchitis [37]	Peninsular India
<i>Nasturtium officinale</i> W.T. Aiton. Brassicaceae	Polypus of nose, diuretic, Asthma, Tuberculosis [37]	Parts of Europe and Asia
<i>Nauclea missionis</i> Wall. ex G. Don. Rubiaceae	Bark in rheumatism, skin troubles [37]	India
<i>Nauclea orientalis</i> (L.) L. Rubiaceae	Bark tonic, antipyretic, vulnerary [37]	Southeast Asia, Australia
<i>Nelumbo nucifera</i> Gaertn. Nelumbonaceae	Tender leaf in prolapse, flower in angina; seed in repeated abortion; root in irregular menstruation [41]	Widespread
<i>Neolitsea umbrosa</i> (Nees) Gamble. Lauraceae	Oil of fruit on skin affections [37]	South east Asia
<i>Nepenthes khasiana</i> Hook.f. Nepenthaceae	Liquid of the pitcher used in for urinary and eye troubles [37]	India
<i>Nepeta ciliaris</i> Benth. Lamiaceae	Leaf and seed in coughs, fevers [37]	India

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Neptunia oleracea</i> Lour. Fabaceae	Stem in ear ache, root in Syphilis [37]	South America
<i>Nigella sativa</i> L. Ranunculaceae	Seed as stimulant, diuretic, galactagogue; in skin affections [37]	South and southwest Asia
<i>Nopalea cochenillifera</i> (L.) Salm-Dyck. Cactaceae	Fruit in rheumatism, scalds, burns, skin diseases, ear ache and tooth ache [37]	Mexico
<i>Nyctanthes arbor-tristis</i> L. Oleaceae	Leaf expectorant, diuretic, fever, rheumatism; bark expectorant; seed in scalp affections [37]	South and southeast Asia
<i>Nymphaea nouchali</i> Burm. f. Nymphaeaceae	Rhizome in dysentery, flower as cardiotonic, seed in cutaneous diseases [37]	Southern and eastern parts of Asia
<i>Nymania capensis</i> (Thunb.) Lindb. Meliaceae	Root in wounds [70]	South Africa
<i>Nymphaea caerulea</i> Sav. Nymphaeaceae	Leaf and stem in skin rash and inflamed wounds [70]	East Africa, Indian subcontinent
<i>Nypa fruticans</i> Wurmb. Arecaceae	Leaf in ulcers, young shoots in herpes [37]	Coastlines of Indian and Pacific Oceans
<i>Ochna pumila</i> Buch. - Ham. ex D. Don. Ochnaceae	Root in epilepsy; leaf on sores [37]	Tropical Asia
<i>Ochna serrulata</i> (Hochst.) Walp. Ochnaceae	Root in gangrenous wounds [88]	South Africa
<i>Ochradenus baccatus</i> Delile. Resedaceae	Fruit antimicrobial [66]	India, Pakistan, Syria, Egypt, Libya
<i>Ocimum basilicum</i> L. Lamiaceae	Stimulant, antipyretic, expectorant, antifungal; seeds diuretic, piles, sores, sinuses [37]	India

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Olea europaea</i> L. Oleaceae	Leaf extract and oil antimicrobial [148]	Mediterranean regions, Africa, Himalayas
<i>Olinia rochetiana</i> A. Juss. Penaeaceae	Eczema, acne and scabies [149]	Some African countries
<i>Ophioglossum vulgatum</i> L. Ophioglossaceae	Styptic, antiseptic, vulnerary; rhizome on boils [37]	Throughout temperate regions
<i>Ophiorrhiza mungos</i> L. Rubiaceae	Root tonic, used in cancer treatment; leaf in ulcers [37]	India, Myanmar, Sri Lanka
<i>Opopanax chironium</i> W.D.J. Koch. Apiaceae	Gum resin from root stimulant and antiseptic [37]	Warm climatic areas
<i>Opuntia ficus-indica</i> (L.) Mill. Cactaceae	Skin rash, ulcers, furuncles, fresh wounds and warts [42,70]	Probably Mexico
<i>Oxalis corniculata</i> L. Oxalidaceae	Cough, respiratory infection, joint pain, skin problems [41]	Cosmopolitan
<i>Oroxylum indicum</i> (L.) Benth. ex Kurz. Bignoniaceae	Root bark tonic, in diarrhoea, dysentery, otorrhoea; plant antiseptic [37]; wound healing [55]	Himalayan foothills
<i>Orthosiphon glabratus</i> Benth. Lamiaceae	Diarrhea, piles; leaves febrifuge, in cuts and wounds [37]	India to Malaysia
<i>Osbeckia chinensis</i> L. Melastomataceae	Diarrhea, wounds; root expectorant [37]	China, Japan, India to Malaysia, Australia
<i>Osmitopsis asteriscoides</i> L. Asteraceae	Leaf in inflammation and cuts [79]	African countries
<i>Osmunda regalis</i> L. Osmundaceae	Roots tonic, styptic, antibacterial; in dysentery, rickets, muscular debility [37]	Parts of Europe, Africa, Asia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Oxystelma esculentum</i> (L. fil.) R. Br. Apocynaceae	Herb antiseptic, galactagogue, as gargle; fresh root at jaundice, latex vulnerary [37]	West Asia to Malesia
<i>Ozoroa engleri</i> R. Fern. & A. Fern. Anacardiaceae	Bark, root and leaf in skin infection [150]	South Africa
<i>Paederia foetida</i> L. Rubiaceae	Leaf in Herpes, diuretic; root in piles, pain of visceral organs, elimination of collected poisons from the body [37]	Asia
<i>Pandanus odorifer</i> (Forssk.) Kuntze. Pandanaceae	Leaf in Leprosy, diseases of heart and brain; anthers in diseases of the blood [37]	Polynesia, Australia, south Asia
<i>Pandanus utilis</i> Bory. Pandanaceae	Root in venereal diseases [37]	Madagascar, Mauritius, Seychelles
<i>Panicum antidotale</i> Retz. Poaceae	Affection of the throat, antidote in Hydrophobia [37]	Himalaya and upper Gangetic plain, India
<i>Parameria barbata</i> (Bl.) K. Schumann. Apocynaceae	Bark for shrinking of uterus, dysentery, wounds [37]	India to Malaysia
<i>Parkia roxburghii</i> G. Don. Fabaceae	Bark and leaf in sores and skin affections [37]	Thailand, Malaysia, Myanmar, India
<i>Paronychia argentea</i> Lam. Caryophyllaceae	Aerial parts antimicrobial [67]	Around the Mediterranean Sea
<i>Passiflora incarnate</i> L. Passifloraceae	Plant sedative, in ulcers and haemorrhoids [37]	America
<i>Pavetta indica</i> L. Rubiaceae	Root tonic, in jaundice, urinary diseases; leaf in ulcerated nose and haemorrhoids [37]	India, Sri Lanka
<i>Pavonia odorata</i> Willd. Malvaceae	Root antipyretic, in dysentery and intestinal haemorrhage [37]	India, Pakistan, Burma, Srilanka, Africa

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Pedaliium murex</i> L. Pedaliaceae	Dysuria, Gonorrhoea, diseases of the genito-urinary system [37]	Tropical Africa, Indian subcontinent
<i>Pedilanthus tithymaloides</i> Poit. Euphorbiaceae	Latex in venereal diseases, warts and Leukoderma patches [37]	Tropical and central America
<i>Peganum harmala</i> L. Nitrariaceae	Seed in asthma, gallstone, fever, jaundice; antimicrobial [36]	India and Pakistan
<i>Pelargonium alchemilloides</i> (L.) L'Hér. Geraniaceae	Leaf in wounds and abscesses [80,88]	Africa, Arabian Peninsula
<i>Pellaea calomelanos</i> (Sw.) Link. Pteridaceae	Leaf and rhizome in boils and abscesses [80,88]	Eastern and southern Africa, Madagascar
<i>Peltophorum pterocarpum</i> (DC.) K.Heyne. Fabaceae	Bark in dysentery, part of gargles, tooth powder, lotion; eye troubles, sores [37]	Tropical south-eastern Asia
<i>Pentanema indicum</i> L. Asteraceae	Plant in skin diseases [65]	Africa, China, Indian subcontinent
<i>Pentania prunelloides</i> (Klotzsch) Walp. Rubiaceae	Root in burns and swellings [79]	Southern Africa
<i>Pergularia daemia</i> (Forssk.) Chiov. Asclepiadaceae	Uterine, menstrual troubles; root and leaf in asthma, diarrhoea; leaf in carbuncles [37]	Tropical Africa, Asia
<i>Pentatropis spiralis</i> (Forssk.) Decne. Asclepiadaceae	Root in Gonorrhoea [37]	Parts of Africa, Pakistan, India
<i>Peristrophe bicalyculata</i> (Retz.) Nees. Acanthaceae	Essential oil anti-tubercular [37]	India, Afghanistan, Africa

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Peristrophe bivalvis</i> (L.) Merr. Acanthaceae	Leaf in cough, dysentery, diarrhoea and bronchitis in Chinese medicine [151]	South-eastern Asia
<i>Phaulopsis dorsiflora</i> (Retz.) Santapau. Acanthaceae	Fresh juice in sores, plant in dressing of wounds [37]	India to Vietnam
<i>Phoenix dactylifer</i> L. Arecaceae	Fruits in respiratory diseases and fever [37]	Lands around Iraq
<i>Phyla nodiflora</i> (L.) Greene. Verbenaceae	Diuretic, febrifuge; in boils, swollen glands, erysipelas, indolent ulcers [37]	Tropical and subtropical part of the world
<i>Phyllanthus distichus</i> Muell-Arg. Phyllanthaceae	Leaf juice protective and curative to diseases like Measles, Pox [41]	Tropical and sub-tropical regions
<i>Phyllanthus fraternus</i> G.L. Webster Phyllanthaceae	Diuretic, febrifuge, in diarrhoea, dysentery, diseases of the uro-genital system; fresh root in jaundice, as galactagogue; latex to sores [37]	Pantropical
<i>Phyllanthus reticulatus</i> Poir. Phyllanthaceae	Leaf in sores, burns and skin irritations [80,88]	Asia
<i>Phyllanthus simplex</i> Retz. Phyllanthaceae	Antiseptic; leaf in Gonorrhea, eye troubles; root preparation in mammary abscess [37]	China, India to Malaysia
<i>Phyllanthus urinaria</i> L. Phyllanthaceae	Diuretic, febrifuge, diseases of the uro-genital system; root in jaundice, latex to sores [37]	Tropical world
<i>Phytolacca americana</i> L. Phytolaccaceae	Leaf in wounds and swellings [88]	Eastern United States, Canada
<i>Phytolacca octandra</i> L. Phytolaccaceae	Leaf in septic wounds [88]	Mexico, central America
<i>Phytolacca dodecandra</i> L. Her. Phytolaccaceae	Fruit in eczema [149]	Tropical and southern Africa

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Picrasma javanica</i> Blume. Simaroubaceae	Bark febrifuge, leaf in sores [37]	Northeast India to Indochina and Malaysia
<i>Picrorhiza kurrooa</i> Royle ex Benth. Plantaginaceae	Rhizome in gastric problems, Leprosy [36]	Himalayan region
<i>Picrorhiza scrophulariiflora</i> Pennel Plantaginaceae	Root in wound healing [55]	India to southwestern China
<i>Pilea microphylla</i> (L.) Liebm. Urticaceae	Gastric and intestinal troubles, diuretic, leaf on sores and bruises [37]	South America
<i>Pimpinella tirupatiensis</i> N. Balakr. & Subram. Apiaceae	Root and tuber in abscess [65]	Southeast India
<i>Pinus roxburghii</i> Sarg. Pinaceae	Oil disinfectant, in chronic bronchitis, gangrene of lungs [37]	Himalayan region
<i>Piper cubeba</i> L.f. Piperaceae	Dysentery, diuretic, Gonorrhoea, bronchial troubles [37]	Southeast Asia to Indonesia
<i>Piper peepuloides</i> Roxb. Piperaceae	Stems and roots in Leprosy [37]	Himalayan region
<i>Pipturus incanus</i> (Blume) Wedd. Urticaceae	Leaf in boils, burns, herpes, gurgle in thrush [37]	Peninsular Malaysia, Australia
<i>Pistacia integerrima</i> ex Brandis. Anacardiaceae	Leaf gall in dysentery, asthma, Phthisis and other respiratory diseases [37]	Himalayan region
<i>Pistia stratiotes</i> L. Araceae	Leaf juice boiled in coconut oil to chronic skin diseases [37]	Pantropical
<i>Pithecellobium clypearia</i> (Jack) Benth. Fabaceae	Leaf on pox pustules, leaf ash in coconut oil on skin affections [37]	India, Sri Lanka

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Pithecolobium dulce</i> (Roxb.) Benth. Fabaceae	Bark, pulp and seed antimicrobial [37]	Pacific coast of Americas
<i>Pittosporum dasycaulon</i> Miq. Pittosporaceae	Bark anti-bacterial and antifungal [37]	Western Ghats, India
<i>Pittosporum floribundum</i> Wight & Arn. Pittosporaceae	Bark febrifuge, in chronic bronchitis and leprosy affections [37]	Some African countries
<i>Plantago afra</i> L. Plantaginaceae	Leaves and seed in suppurating wounds, pustules, eczema, furuncles and itching [88]	Mediterranean region, western Asia
<i>Plantago amplexicaulis</i> Cav. Plantaginaceae	Seed in intermittent fever, pulmonary affections, ophthalmia [37]	Southern Europe to western Asia
<i>Plantago asiatica</i> L. Plantaginaceae	Seed in haematuria, diseases of gastro-intestinal and genito-urinary tracts [37]	East Asia
<i>Plantago himalaica</i> Pilger. Plantaginaceae	Leaf in wounds [37]	Pakistan to Nepal
<i>Plantago lanceolata</i> L. Plantaginaceae	Leaf and root vulnerary, in pulmonary diseases; leaf antibacterial; seed diuretic, haemostatic [37]	Eurasia
<i>Plantago major</i> L. Plantaginaceae	Leaf febrifuge, diuretic, vulnerary, diarrhoea, piles, eye wash; root febrifuge, diuretic, tonic [37]	Europe, northern and central Asia
<i>Plantago ovata</i> Frossk. Plantaginaceae	Seed febrifuge, in affections of kidney, bladder and urethra [37]	Western and southern Asia
<i>Plantanus orientalis</i> L. Plantanaceae	Bark antirheumatic, in diarrhoea and dysentery [37]; plant in Leprosy [98]	Southeast Europe to west Asia
<i>Platycodon grandifloras</i> (Jacq.) A.DC. Campanulaceae	Root tonic, expectorant, in throat ailment [37]	East Asia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Plectranthus asirensis</i> J.R.I. Wood. Lamiaceae	Essential oil antimicrobial [66]	Sub-Saharan Africa, Madagascar, India
<i>Plectranthus amboinicus</i> (Lour.) Spreng. Lamiaceae	Antiseptic, antimicrobial, diuretic, tonic [152]	Southern and Eastern Africa
<i>Plectranthus macranthus</i> Hook.f. Lamiaceae	Used in sores [37]	India, Myanmar, Vietnam
<i>Pleopeltis lanceolata</i> Kaulf. Polypodiaceae	Cold, sore throat [37]	South America
<i>Pluchea indica</i> (L.) Less. Asteraceae	Leaf in atonic and gangrenous ulcers [37]	Parts of Asia and Australia
<i>Plumbago auriculata</i> Lam. Plumbaginaceae	Black water fever, root in glandular Tuberculosis [37]	South Africa
<i>Plumbago coccinea</i> (Lour.) Salisb. Plumbaginaceae	Root in Leukoderma, Syphilis and Leprosy [37]	Southeast Asia
<i>Plumbago zeylanica</i> L. Plumbaginaceae	Root diuretic, in piles, diarrhoea, skin diseases, influenza, black water fever [37]	Pantropical
<i>Plumeria acuminata</i> W.T. Aiton. Apocynaceae	Bark stimulant, febrifuge; in venereal affections, anti-herpetic [37]	Mexico, central America
<i>Plumeria alba</i> L. Apocynaceae	Latex in ulcers, herpes; seed haemostatic; bark stimulant, febrifuge; in venereal affections [37]	Central America and the Caribbean
<i>Podophyllum hexandrum</i> Royle. Berberidaceae	Resin with anti-cancer activity [37]; rhizome in skin diseases [36]	Himalayan region
<i>Pogostemon benghalensis</i> (Burm.f.) Kuntze. Lamiaceae	Shoot and whole plant in wounds [153]	Indian subcontinent

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Polygala chinensis</i> L. Polygalaceae	Leaf in asthma, chronic bronchitis and catarrhal affections [37]	India to Malaysia and China
<i>Polygala senega</i> L. Polygalaceae	Chronic bronchitis and asthma [37]	North America
<i>Polygala sibirica</i> L. Polygalaceae	Root in colds, coughs, chronic chest troubles, diarrhoea, inflammation of urinary bladder; externally in mammary abscess and carbuncles [37]	East Europe to east Asia
<i>Polygonatum cirrhifolium</i> (Wall.) Royle. Asparagaceae	Used as tonic and vulnerary [37]	Native to China
<i>Polygonatum multiflorum</i> (L.) All. Asparagaceae	Rhizome tonic, in bruises, piles, tumours, scar discoloration of skin [37]	Europe and temperate Asia
<i>Polygonum aviculare</i> L. Polygalaceae	Tonic, antipyretic, diuretic, haemostatic, in diabetes, rheumatism, ulcer, diarrhoea [37]	Eurasia and North America
<i>Polygonum bistorta</i> (L.) Samp. Polygalaceae	Febrifuge, diuretic, expectorant, haemostatic [37]; infectious diseases, antiseptic, disinfectant [95]	Europe, north and west Asia
<i>Polygonum chinense</i> L. Polygalaceae	Herb tonic and vulnerary [37]	China, Japan, India to Malaysia
<i>Polygonum hydropiper</i> L. Polygalaceae	Contraceptive, uterine disorder, tonic, diuretic, in skin affections [37]	Almost pantropical
<i>Polygonum orientale</i> L. Polygalaceae	Tonic and vulnerary; nut in Tuberculosis [37]	China to the Himalayas
<i>Polygonum persicaria</i> L. Polygalaceae	Styptic, vulnerary, lithotriptic, in colds, fever, asthma, gargle of pharynx [37]	Eurasia
<i>Polygonum plebeium</i> R.Br. Polygalaceae	Bowel complaints, pneumonia [37]	South Asia including India

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Polygonum viviparum</i> L. Polygalaceae	Tonic, diarrhoea, dysentery, haemoptysis, gargle and lotion of ulcers [37]	Almost pantropical
<i>Polyscias fruticosa</i> (L.) Harms. Araliaceae	Leaf and root diuretic, in dysuria, stones and gravels; leaf vulnerary [37]	South-eastern Asia
<i>Pometia pinnata</i> J.R.Forst. & G.Forst. Sapindaceae	Bark in festering sores [37]	India, Malaysia to Pacific islands
<i>Pongamia pinnata</i> (L.) Pierre. Fabaceae	Seed oil in herpes, leukoderma, skin diseases; leaf in ulcers, sores, Leprosy and Gonorrhoea [37]	Asia
<i>Portulaca oleracea</i> L. Portulacaceae	Vulnerary, diuretic; diseases of liver, spleen, kidney, bladder, mouth ulcer, burns and scalds [37]	Old World countries
<i>Portulaca pilosa</i> L. Portulacaceae	Asthma, cough, urinary problems, ulcers, haemorrhoids, Erysipelas [37]	Southern United States to Brazil
<i>Portulaca tuberosa</i> Roxb. Portulacaceae	Plant in dysuria, leaf in Erysipelas [37]	India, Pakistan, Srilanka
<i>Potentilla anserine</i> L. Rosaceae	Tonic, vulnerary, diarrhoea, leucorrhoea, kidney stones, arthritis, cramps [37]	Temperate Northern hemisphere
<i>Pothos scandens</i> L. Araceae	Leaf in Smallpox, root boiled in oil for abscess [37]	India to Malaysia and Madagascar
<i>Pouzolzia zeylanica</i> (L.) Benn. & R. Br. Urticaceae	Leaf galactagogue, vulnerary, in gangrenous ulcers; herb in sores and boils [37]	Tropical Asia
<i>Premna herbacea</i> Roxb. Lamiaceae	Leaf in fever, cough, rheumatism, boils [37]	China to tropical Asia
<i>Premna integrifolia</i> L. Lamiaceae	Leaf diuretic, leaf and root in jaundice, root in obesity, stem cover in high cholesterol [41]	Tropical sea coast
<i>Premna tomentosa</i> Willd. Lamiaceae	Leaf diuretic, vulnerary, in dropsy, after parturition; bark in diarrhoea; root in stomach ache [37]	Peninsular India and Sri Lanka

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Prinsepia utilis</i> Royle. Rosaceae	Leaf in cuts, wounds, burns [72]	Himalayas from Pakistan to China
<i>Prismatomeris tetrandra</i> (Roxb.) K. Schum. Rubiaceae	Leaf in stomach ache, wounds [37]	Cambodia, India, Thailand, Vietnam
<i>Priva cordifolia</i> (L.f.) Druce. Verbenaceae	Seed in sores and wounds [88]	Indian subcontinent, Africa
<i>Prunus amygdalus</i> Batsch. Rosaceae	Kernel lithotrophic, diuretic, peptic ulcer, irritable sores, skin eruptions [37]	Middle East, Indian subcontinent, Africa
<i>Prunus persica</i> (L.) Batsch. Rosaceae	Leaf or bark in whooping cough [37]	Northwest China
<i>Prunus serotina</i> Ehrh. Rosaceae	Bark in phthisis, bronchitis [37]	North and south America
<i>Pseuderanthemum bicolor</i> (Schrank) Radlk. Acanthaceae	Root, stem and leaf in aphthae and wound [37]	India to Malaysia, Philippines Cuba etc.
<i>Psidium guajava</i> L. Myrtaceae	Leaf in boils, ulcers and wounds [80,88]	Caribbean, Central and South America
<i>Psychotria montana</i> Blume. Rubiaceae	Root in preparation for ulcer; lotion for enlarged spleen, as febrifuge [37]	India to Malaysia
<i>Psychotria sarmentosa</i> Blume. Rubiaceae	Leaf on sores [37]	India to Malaysia
<i>Psychotria viridiflora</i> Reinw. ex Blume. Rubiaceae	Leaf, bark and stem in skin affections [37]	India to Malaysia
<i>Pteris multifida</i> Poiret. Pteridaceae	Rhizome and frond in dysentery; toasted paste on cutaneous affections [37]	Japan, Korea, China, Vietnam

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Pterocarpus indicus</i> Willd. Fabaceae	Dropsy, bladder stone, diarrhoea, thrush; Kino of bark on sores [37]	China, Japan, Myanmar to Malaysia
<i>Pterocarpus marsupium</i> Roxb. Fabaceae	Resin in fever, toothache; leaf in boil, sore, skin diseases [36]	India, Nepal, Sri Lanka
<i>Pterocarpus santalinus</i> Lin.f Fabaceae	Pyrexia, bloody urine, bleeding from nose and ear, ringworm and skin diseases, ulcer [41]	Southern India
<i>Pterospermum acerifolium</i> (L.) Willd. Sterculiaceae	Flower in inflammations, ulcers, tumours, Leprosy [37]	Southeast Asia
<i>Pueraria tuberosa</i> (Willd.) DC. Fabaceae	Root in wound healing [99]	India, Pakistan, Nepal
<i>Pulicaria crispa</i> (Forssk.) Oliv. Asteraceae	Febrifuge, vulnerary; in bruises and sores of bullocks [37]	Dry parts of Asia and Africa
<i>Pulicaria guestii</i> Rech.f. & Rawi. Asteraceae	Aerial parts antimicrobial [66]	Arabian Peninsula
<i>Punica granatum</i> L. Lythraceae	Flower buds in bronchitis [37]; pericarp antimicrobial [54]	Iran and northeast Turkey
<i>Pupalia lappacea</i> (L.) Juss. Amaranthaceae	Fruit with palm oil to boils; in cough and fever; ashes used in Leprosy [37]	Peninsular India, Sri Lanka, East Africa
<i>Pyrola rotundifolia</i> L. Ericaceae	Antilithic; in excessive menstrual, bloody stools, hemorrhages, ulcers in the urinary tract [37]	Europe, Japan, Myanmar, Russia
<i>Quassia indica</i> (Gaertn.) Nootboom. Simaroubaceae	Wood infusion as tonic; bark febrifuge, in skin affections [37]	India, Myanmar, Sri Lanka

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Quercus infectoria</i> Oliv. Fagaceae	Bark and acorns used in intertrigo, impetigo, eczema [37]	Greece, Asia Minor
<i>Quisqualis indica</i> L. Combretaceae	Seed in fever, diarrhoea, ricket, skin diseases [37]	Asia
<i>Radermachera xylocarpus</i> (Roxb.) K. Schum. Bignoniaceae	Wood resin in skin troubles [37]	India
<i>Randia fasciculata</i> (Roxb.) DC. Rubiaceae	Leaf on sores [37]	China, India to Malaysia
<i>Ranunculus arvensis</i> L. Ranunculaceae	Gout, asthma, intermittent fevers; having antibacterial activity [37]	Western Asia, Europe
<i>Ranunculus sceleratus</i> L. Ranunculaceae	Asthma, rheumatism, cutaneous disorder; seed tonic, in kidney troubles [37]	Temperate North America and Eurasia
<i>Rauvolfia caffra</i> Sond. Apocynaceae	Bark in Measles, urticaria and other skin rashes [88]	South Africa to tropical Africa
<i>Rauvolfia tetraphylla</i> L. Apocynaceae	Herb extract in castor oil to skin ailments [37]	Mexico, central and south America
<i>Reissantia grahamii</i> (Wight) Ding Hou. Celastraceae	Root to control infection of respiratory tract [37]	India to Malaysia
<i>Reissantia indica</i> (Willd.) N. Hallé. Celastraceae	Sap febrifuge; root bark in infection of respiratory tract [37]	India to Malaysia
<i>Rhamnus nepalensis</i> (Wall.) Lawson. Rhamnaceae	Fruit mixed with vinegar and used in Herpes [37]	China to the Himalayas
<i>Rheum emodi</i> L. Polygonaceae	Root in cuts and wounds [154]	Sub-alpine and alpine Himalayas

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Rhinacanthus nasutus</i> (L.) Kurz. Acanthaceae	Fresh root and leaf with lime in eczema, ringworm; leaf in cancer, root antiseptic [37]	India, Sri Lanka, Java, Madagascar
<i>Rhododendron campanulatum</i> D.Don. Ericaceae	Leaf in chronic rheumatism, Syphilis and sciatica [37]	Himalayas from Kashmir to Bhutan
<i>Rhus succedanea</i> L. Anacardiaceae	Galls of the branch expectorant, tonic, in diarrhoea, dysentery [37]	Asia, Australia, New Zealand
<i>Rhynchosia beddomei</i> Baker. Leguminosae	Leaf in skin diseases [65]	India and some other Asian countries
<i>Ricinus communis</i> L. Euphorbiaceae	Wounds, sores, boils [80,88]; eczema, dermatitis [36]	Mediterranean basin, eastern Africa, India
<i>Rosa banksiae</i> W.T.Aiton. Rosaceae	Root tonic, anthelmintic; leaf vulnerary [37]	China
<i>Rosa chinensis</i> Jacq. Rosaceae	Hips in wounds, sprains and ulcers [37]	Southwest China
<i>Rosa multiflora</i> Thunb. Rosaceae	Fruits in foul ulcers [37]	Eastern Asia
<i>Rosa multiflora</i> Thunb. Rosaceae	Flower in wounds, injuries [44]	Eastern Asia
<i>Rothmannia capensis</i> Thunb. Rubiaceae	Fruit in burns and wounds [88]	African countries
<i>Rotula aquatica</i> Lour. Boraginaceae	Root diuretic; in piles, bladder stone, venereal diseases [37]	India
<i>Rourea minor</i> Leenh. Connaraceae	Roots and twigs tonic, febrifuge; in pulmonary complaints, diabetes, ulcer, skin troubles [37]	India, Sri Lanka, Bangladesh, Malaysia
<i>Rubia cordifolia</i> L. Rubiaceae	Roots tonic, antidysentery, antiseptic [37]	Asia, Africa, Europe

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Rubia tinctorum</i> L. Rubiaceae	Roots tonic, diuretic, lithonotropic; diseases of liver, spleen, arthritis, bed sores [37]	Europe
<i>Rubus fruticosus</i> L. Rosaceae	Wound healing, antiseptic, disinfectant [47, 132]	Europe, part of Africa, Asia, Americas
<i>Rubus moluccanus</i> L. Rosaceae	Root juice in fistula [37]	Himalayas, India to Malaysia, Australia
<i>Rumex acetosa</i> L. Polygonaceae	Bronchial diseases, diuretic, cutaneous tumour, skin troubles, diarrhoea [37]	Europe, Northwest Africa, part of Asia
<i>Rumex dentatus</i> L. Polygonaceae	Skin diseases [72]	Parts of Eurasia, north Africa
<i>Rumex lanceolatus</i> Thunb. Polygonaceae	Leaf in abscesses, boils, bruises, tumors [80,88]	Southern Africa
<i>Rumex nepalensis</i> Spreng. Polygonaceae	Leaf infusion in Syphilis [37]	Part of Europe, Asia, Africa
<i>Rumex nervosus</i> Vahl. Polygonaceae	Aerial part antimicrobial [66]	Part of Africa, Asia, Europe
<i>Rungia parviflora</i> Nees. Acanthaceae	Root febrifuge, leaf on contusion [37]; in Leprosy, Small pox [72,98]	Peninsular India
<i>Rungia repens</i> (L.) Nees. Acanthaceae	Cough, fever, diuretic; mixed with castor oil for fungal infection of scalp [37]	India, Sri Lanka
<i>Ruppia maritima</i> L. Ruppiaceae	Depurant and vulnerary [37]	Mediterranean region, Africa, Europe
<i>Ruta chalepensis</i> L. Rutaceae	Aerial part antimicrobial [67]	Eurasia, North Africa
<i>Sagittaria sagittifolia</i> L. Alismataceae	Tuber in cutaneous troubles, leaf in sore throat, breast inflammation [37]	Most of Europe, temperate Asia, USA
<i>Salacia chinensis</i> L. Celastraceae	Root in diabetes, amenorrhoea, dysmenorrhoea, venereal diseases [37]	India to Malaysia

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Salacia macrophylla</i> Blume. Celastraceae	Root given after parturition; leaf in eczema and abdominal pain [37]	India to Malaysia
<i>Salacia oblonga</i> Wall. Celastraceae	Root bark in rheumatism, gonorrhoea, asthma, and ear troubles [37]	India, Sri Lanka
<i>Salacia reticulate</i> Wight. Celastraceae	Root bark in Gonorrhoea, itch, swelling [37]	Sri Lanka
<i>Salix tetrasperma</i> Roxb. Salicaceae	Leaf in rheumatism, venereal diseases, bladder stone, piles; bark as febrifuge [37]	India to Malaysia, South China
<i>Salvadora oleoides</i> Decne. Salvadoraceae	Leaf expectorant, fruit in splenomegaly, low fever, rheumatism [37]	India, Pakistan, southern Iran
<i>Salvia coccinea</i> Buc'hoz ex Etl. Lamiaceae	In renal troubles and Tuberculosis [37]	Central and south America
<i>Salvia moorcroftiana</i> Wall. Ex Benth. Lamiaceae	Leaf expectorant, in boils, wounds, skin affections; seed in dysentery, haemorrhoids [37]	Himalayan region
<i>Salvia officinalis</i> L. Lamiaceae	General infectious diseases, antiseptic, disinfectant [95]	Mediterranean region
<i>Sambucus nigra</i> L. Adoxaceae	Expectorant, diuretic, depurative, febrifuge, rheumatism, cold, inflamed throat, neuralgia[37]	Europe and North America
<i>Sanicula europaea</i> L. Apiaceae	Pulmonary diseases, diarrhea, dysentery, menorrhagia, bleeding piles, in ulcer ointment [37]	Europe
<i>Sansevieria trifasciata</i> Prain. Asparagaceae	Root tonic, leaf on sores [37]	Tropical west Africa
<i>Santalum album</i> L. Santalaceae	Oil in Cystitis, Gonorrhoea, cough, Tuberculosis [36]	India, Indonesia, Malaysia
<i>Santolina chamaecyparissus</i> L. Asteraceae	Stimulant, analgesic, vermifuge, vulnerary [37]	Western and central Mediterranean

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Sapindus trifoliatus</i> L. Sapindaceae	Fruit tonic, asthma, diarrhoea, Cholera, Tuberculosis, paralysis; root and bark expectorant [37]	South Asia
<i>Sapium sebiferum</i> (L.) Roxb. Euphorbiaceae	Oil vulnerary, in skin troubles [37]	Eastern Asia
<i>Saponaria officinalis</i> L. Caryophyllaceae	Expectorant, diuretic, Tuberculosis, hepatic problems, venereal ulcers, skin troubles [37]	Europe, Asia to western Siberia
<i>Saraca asoca</i> (Roxb.) Willd. Fabaceae	Uterine tonic, uterine affections, fibroid, haemorrhoids, haemorrhagic dysentery [37]	Indian subcontinent
<i>Sarcostemma acidum</i> (Roxb.) Voigt. Apocynaceae	Root given after rabid dog bite [37]	India, Myanmar, Thailand, Vietnam
<i>Sarcostigma kleinii</i> Wight & Arn. Icacinales	Bark in rheumatism, Leprosy, hysteria [37]	India to Malaysia
<i>Sarcostemma viminalis</i> (L.) L. Apocynaceae	Latex in skin lesions, cuts, ulcers, septic wounds [70]	West Africa
<i>Sassafras albidum</i> (Nutt.) Nees. Lauraceae	Root stimulant, diuretic, rheumatism, gout, scurvy, eye lotion, cutaneous troubles [37]	Eastern North America
<i>Satureja hortensis</i> L. Lamiaceae	Oil for anti-bacterial and anti-fungal properties [37]	South-eastern Europe to western Asia
<i>Saussurea heteromalla</i> (D. Don) Hand.- Mazz. Compositae	Leaf on wounds [37]	Himalayan region
<i>Saussurea hypoleuca</i> Spreng. Ex DC. Asteraceae	Leaf in Syphilis [37]	Himalayan region, western China
<i>Saussurea costus</i> (Falc.) Lipsch. Asteraceae	Root tonic, in asthma, cough, rheumatism, chronic skin diseases [37]	South Asia

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Saussurea obvallata</i> (DC.) Edgew. Asteraceae	Root used in preparation for wounds and cuts [37]	Himalayan region
<i>Scabiosa columbaria</i> L. Dipsacaceae	Leaf and root in wounds [70,79]	Europe
<i>Scadoxus puniceus</i> (L.) Friis & Nordal. Amaryllidaceae	Bulb and root in wounds, ulcers, sores, allergies [80,88]	Some African countries
<i>Schima wallichii</i> (DC.) Korth. Theaceae	Leaf, bark and fruit in cuts and wounds [7,123]	Himalayan region
<i>Schinus molle</i> L. Anacardiaceae	Fruit stomachic, diuretic, in bronchial and urinary affections [37]	Western south America
<i>Schizaea dichotoma</i> (L.) Smith. Schizaeaceae	Rhizome in respiratory problems, given after parturition [37]	Pleotropic
<i>Schleichera oleosa</i> (Lour.) Merr. Sapindaceae	Seed oil used in skin troubles, bark in ulcers [37]	India to Malaysia
<i>Schrebera swietenoides</i> Roxb. Oleaceae	Leaf in splenomegaly, root in Leprosy, bark in boils and burns, fruits in hydrocele [37]	India and Myanmar
<i>Scilla natalensis</i> Planch. Hyacinthaceae	Bulb in boils and sores [88]	Southern Africa
<i>Scoparia dulcis</i> L. Plantaginaceae	Fever, cough, bronchitis, tooth- ache, gravel and other renal troubles, diabetes [37]	Tropical and subtropical world
<i>Securidaca longepedunculata</i> Fresen. Polygalaceae	Leaf and bark in wounds and sores [88]	Tropical and subtropical Africa
<i>Sedum crassipes</i> Wall. Crassulaceae	Plant is vulnerary [37]	Himalayan region

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Sedum multicaule</i> Wallich ex Lindley. Crassulaceae	Plant is vulnerary [37]	Himalayan region
<i>Semecarpus anacardium</i> Lf. Anacardiaceae	Exudate in Leprosy, nervous debility; fruit in ascites, asthma, psoriasis, warts, tumours [37]	India
<i>Senecio concolor</i> DC. Compositae	Leaf in cuts and wounds [81]	Some African countries
<i>Senecio latifolius</i> DC. Compositae	Leaf in burns and wounds [81]	Some African countries
<i>Senecio serratuloides</i> DC. Compositae	Leaf and stem in cuts, swelling, burns and sores [88]	Some African countries
<i>Senecio tenuifolius</i> Burm.f. Asteraceae	Leaf vulnerary [37]	India and Indonesia
<i>Senna alata</i> (L.) Roxb. Caesalpinioideae	Leaf juice in skin troubles [37]; wound healing, antibacterial [45]	Mexico
<i>Senna italica</i> Mill. Fabaceae	Root in wounds, burns, furuncles [88]	African countries
<i>Senna sophora</i> (L.) Roxb. Fabaceae	Leaf bark and seeds cathartic; leaf juice in ringworm [37]	Most tropical countries
<i>Senna tora</i> (L.) Roxb. Fabaceae	Leaf purgative, in ringworm and other skin diseases [37]	Probably south Asia
<i>Serissa foetida</i> (L.f.) Lam. Rubiaceae	Leaf in carbuncles, cancer [37]	Southeast Asia
<i>Sesamum indicum</i> L. Pedaliaceae	Seed plaster in burns, scalds; fresh leaf in urinary, eye and skin affections [37]	Pantropic

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Sesbania grandiflora</i> (L.) Poiret. Fabaceae	Expectorant, febrifuge, scabies, tonic, diuretic, ulceration of the tongue and alimentary canal [37]	Malaysia to North Australia
<i>Sesbania sesban</i> (L.) Merr. Fabaceae	Pox, pyrexia, diabetes, leukoderma, as antifertility of females [41]	Tropical countries
<i>Sida acuta</i> Burm.f. Malvaceae	Haemorrhoids, impotency, tonic, antipyretic, urinary disorders [37]	Central America
<i>Sida veronicaefolia</i> Lam. Malvaceae	Tonic, febrifuge, urinary complaints, Gonorrhoea, cuts and bruises [37]	Southern China, Nepal
<i>Sida cordifolia</i> L. Malvaceae	Seed as sex tonic and in Gonorrhoea, root in fever, female diseases, wound healing [36]	India
<i>Sida dregei</i> Burtt Davy. Malvaceae	Leaf in sores [80,88]	Some African countries
<i>Sida rhombifolia</i> L. Malvaceae	Diuretic, febrifuge, rheumatism, skin troubles, Tuberculosis [37]	New World tropics and subtropics
<i>Sida spinosa</i> L. Malvaceae	Debility, fever, Gonorrhoea [37]	Pantropical
<i>Sigesbeckia orientalis</i> L. Asteraceae	Ringworm, gangrenous ulcers and sores [37]	Africa, Asia
<i>Silybum marianum</i> (L.) Gaertn. Asteraceae	Jaundice, calculi of gall bladder, intermittent fever, dropsy, uterine troubles, cancer [37]	Southern Europe
<i>Smilax china</i> L. Smilacaceae	Tubers in venereal diseases, rheumatism, chronic skin infections [37]	China, Korea, Japan, Myanmar to India
<i>Smilax glabra</i> Roxb. Smilacaceae	Root in sores and venereal diseases [37]	China, the Himalayas and Indochina
<i>Smilax ovalifolia</i> Roxb. ex D. Don. Smilacaceae	Root in venereal diseases, rheumatism, dysentery, urinary problems [37]	Himalayan region

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Smilax zeylanica</i> L. Smilacaceae	Root in venereal diseases, sores, swelling, abscesses [37]	India to Malaysia
<i>Solanum aculeatissimum</i> Jacq. Solanaceae	Fruit in skin complaints, root in tooth ache, seed smoke in ulcerated nose [37]	Africa, South America
<i>Solanum aviculare</i> G. Forst. Solanaceae	Sores and ulcers [37]	Australia
<i>Solanum dulcamara</i> L. Solanaceae	Tumours, warts, rheumatism and skin affections [37]	Europe and Asia
<i>Solanum erianthum</i> D.Don. Solanaceae	Root in urinary troubles, vaginal discharge, glanders of horse [37]	Americas
<i>Solanum ferox</i> L. Solanaceae	Antipyretic, sore throat, cough, asthma, rheumatism, dropsy [37]	Indonesia, Thailand, Philippines
<i>Solanum giganteum</i> Jacq. Solanaceae	Leaf in festering sores [80,88]	Africa, southern India, Srilanka
<i>Solanum hermannii</i> Dunal. Solanaceae	Fruit, leaf and root in wounds, boils and non-specific skin infections [80,88]	South Africa
<i>Solanum incanum</i> L. Solanaceae	Leaf and root in wounds, furuncles, ringworm [88]	Sub-Saharan Africa, Middle East, India
<i>Solanum indicum</i> L. Solanaceae	Root in cough, catarrhal affections, nasal ulcers [37]	Indian subcontinent
<i>Solanum melongena</i> L. Solanaceae	Stimulant, in otitis, ulcer of nose, bronchitis, asthma [37]	Worldwide
<i>Solanum nigrum</i> L. Solanaceae	Wounds, ulcers, septic pimples, furuncles, ringworm [36,70]	Eurasia
<i>Solanum panduriforme</i> E. Mey. Solanaceae	Plant sap in non-specific skin infections [88]	Some African countries

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Solanum tomentosum</i> L. Solanaceae	Fruit in non-specific skin infections [88]	Some African countries
<i>Solanum tuberosum</i> L. Solanaceae	Leaf in cough, tuber paste in burns [37]	Andes mountain region
<i>Solanum virginianum</i> L. Solanaceae	Asthma, cough, vesicular eruptions, sore throat, rheumatism [37]	India to Malaysia, Australia
<i>Solena heterophylla</i> Lour. Cucurbitaceae	Leaf juice wound healing [155]	Himalayan region, Australia
<i>Solidago virgaurea</i> L. Asteraceae	Asthma, whooping cough, internal lesions, chronic eczema, nephritis, old ulcers [37]	Part of Europe, Africa, Asia
<i>Sonchus arvensis</i> L. Asteraceae	Roots in cough, bronchitis; latex in eye troubles [37]	Northern parts of Europe
<i>Sonchus asper</i> (L.) Hill. Asteraceae	Wounds and bruises [37]	Europe, north Africa, western Asia
<i>Sonchus oleraceus</i> L. Asteraceae	Wounds and ulcers [80]	Europe and western Asia
<i>Sorbus aucuparia</i> L. Rosaceae	Diuretic, hemorrhoids, cough, bronchitis, leucorrhoea, diarrhea [37]	Most of Europe, Asia, northern Africa
<i>Sparganium stoloniferum</i> (Buch. -Ham.) Ex Juzepczuk. Typhaceae	Fruit hemostatic, decoction vulnerary [37]	Southwest Asia, North America
<i>Spathodea campanulate</i> P.Beauv. Bignoniaceae	Skin diseases, dysentery, renal troubles, urethral inflammations, gastro intestinal troubles [37]	Tropical Africa
<i>Spergula arvensis</i> L. Caryophyllaceae	Diuretic; in pulmonary Tuberculosis [37]	Worldwide
<i>Spergularia rubra</i> (L.) C. Pres. Caryophyllaceae	Cystitis, urethral pain [37]	Worldwide

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Spermacoce natalensis</i> Hochst. Rubiaceae	Root in rash with fever [88]	Some African countries
<i>Sphaeranthus indicus</i> L. Asteraceae	Styptic, tonic, hepatic and gastric disorders, chest troubles, Tuberculosis [37]; skin diseases [65]	India
<i>Spinacia oleracea</i> L. Amaranthaceae	Diuretic; in fever, bowel inflammation, having antibacterial action [37]	Central and western Asia
<i>Spondias mombin</i> L. Anacardiaceae	Expectorant, diuretic, febrifuge, eye troubles, vulnerary [37]	Tropical Americas
<i>Spondias pinnata</i> (L. f.) Kurz. Anacardiaceae	Diarrhea, dysentery, rheumatism, irregular menstruation, Tuberculosis [37]	Malaysia, Philippines, Indochina
<i>Stachys schimperi</i> Vatke. Lamiaceae	Aerial part antimicrobial [66]	Arab, Africa
<i>Stachytarpheta jamaicensis</i> (L.) Vahl. Verbenaceae	Venereal diseases, ulcers, erysipelas, dropsy, stomach ailments, ulceration of nose [37]	Caribbean islands
<i>Stemona tuberosa</i> Lour. Stemonaceae	Tuberous root bacteriostatic, used in Pthysis and cough [37]	China, India, southeast Asia, New Guinea
<i>Stephania glabra</i> (Roxb.) Miers. Menispermaceae	Pulmonary Tuberculosis, asthma, intestinal complaints [37]	Global distribution
<i>Stephania abyssinica</i> (Quart. -Dill. & A. Rich.) Walp. Menispermaceae	Root in boils [80,88]	Some African countries
<i>Stephania japonica</i> (Thunb.) Miers. Menispermaceae	Root in fever, diarrhoea, dyspepsia, urinary diseases [37]	USA, southeast Asia, Pacific region
<i>Sterculia setigera</i> Del. Sterculiaceae	Stem bark and seed in skin diseases [73]	Indian subcontinent

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Sterculia urens</i> Roxb. Sterculiaceae	Bark to heal foot cracks [99]	India, Burma
<i>Stereospermum suaveolens</i> (Roxb.) DC. Bignoniaceae	Tonic, intermittent and puerperal fevers, chest and brain affections [37]	South Asia
<i>Streblus asper</i> Lour. Moraceae	Ulcers, sinuses, boils, dysentery, fever, sore heals, piles, leukoderma [37]	India to Malaysia
<i>Strychnos cinnamomifolia</i> Thwaites. Loganiaceae	Root in ulcers, rheumatism, fever, epilepsy [37]	Indo Myanmar, China
<i>Strychnos ignatia</i> Lindl. Loganiaceae	Seed in Cholera, asthma, dropsy, rheumatism, piles [37]	Philippines, parts of China
<i>Strychnos nux-vomica</i> L. Loganiaceae	Leaf on wound and ulcer, fresh wood juice in dysentery, fever, Cholera, dyspepsia [37]	India, southeast Asia
<i>Strychnos potatorum</i> L.f. Loganiaceae	Tonic, diarrhoea, diabetes, Gonorrhoea, eye troubles [37]	India and Myanmar
<i>Strychnos spinosa</i> Lam. Loganiaceae	Leaf in dermatitis, loss of fur, skin diseases [73]	Tropical and subtropical Africa
<i>Styrax benzoin</i> Dryand. Styracaceae	Expectorant, diuretic; in indolent sores and ulcers of animals [37]	Sumatra, Indonesia
<i>Sutherlandia frutescens</i> (L.) R.Br. Fabaceae	Leaf in problems of stomach, intestine, uterus, liver; in influenza, rheumatism, haemorrhoid, dropsy, eye trouble [37]	South Africa
<i>Symplocos racemosa</i> Roxb. Symplocaceae	Bark in eye infection, ulcer, wounds, elephantiasis, fat in urine [36]	China, south Asia
<i>Symplocos paniculata</i> Miq. Symplocaceae	Bark tonic, in ulcer, wounds [36]	India, Japan, South Korea

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Syzygium alternifolium</i> Walp. Myrtaceae	Fruit in wounds [65]	India
<i>Symplocos laurina</i> (Retz.) Wall. ex G. Don. Symplocaceae	Bark in haemorrhage, diarrhoea, Gonorrhoea, eye diseases [37]	India to Malesia, China
<i>Symplocos racemosa</i> Roxb. Symplocaceae	Bark in diarrhoea, liver complaints, dropsy, uterine disorder, ophthalmia, gum bleeding [37]	China, south Asia
<i>Syzygium cerasoides</i> (Roxb.) Raizada. Myrtaceae	Bark in dysentery, bronchitis; fruit in rheumatism, joint pain [37]	China, Indian to Malaysia, Australia
<i>Tabebuia impetiginosa</i> (Mart. ex DC.) Mattos. Bignoniaceae	Inner bark antioxidant [156]	South America
<i>Tacca integrifolia</i> Ker Gawl. Dioscoreaceae	Tubers in haemorrhagic diathesis, cachexia, Leprosy [37]	Tropical and subtropical central Asia
<i>Tagetes erecta</i> L. Asteraceae	Rheumatism, cold, bronchitis, renal troubles, boils, carbuncles, eye troubles [37]	Mexico
<i>Tagetes minuta</i> L. Asteraceae	Wound healing, antiseptic, disinfectant [132]	South America
<i>Tamarix troupii</i> Hole. Tamaricaceae	Diarrhea, dysentery, foul and sloughing ulcers, sore throat, piles [37]	Afghanistan to Myanmar, Sri Lanka
<i>Tarenna asiatica</i> (L.) Kuntze ex K. Schum. Rubiaceae	Wound healing [157]	Indian subcontinent
<i>Tanacetum vulgare</i> L. Asteraceae	Oil in rheumatism, bruises, chronic ulcers; leaf tonic, in hepatic troubles [37]	Temperate Europe and Asia
<i>Taverniera cuneifolia</i> (Roth) Arnott. Papilionaceae	Leaf on sloughing wounds [37]	Pakistan, India

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Taxodium distichum</i> (L.) Rich. Cupressaceae	Resin of cones diuretic, vulnerary [37]	USA
<i>Taxodium mucronatum</i> Ten. Cupressaceae	Diarrhea, bronchial troubles; resin on wounds and ulcers [37]	Mexico, United States
<i>Tectona grandis</i> L.f. Lamiaceae	Flower in urinary problems, bronchitis; seed diuretic; bark in bronchitis [37]	India, Indonesia, Myanmar, Thailand
<i>Tephrosia purpurea</i> (L.) Pers. Fabaceae	Diuretic, bronchitis, boils, pimples, bleeding piles; seed oil in eczema [37]; antimicrobial [36]	Pantropical
<i>Tephrosia uniflora</i> Pers. Fabaceae	Diuretic, bronchitis, boils, Syphilis [37]	Africa
<i>Teramnus labialis</i> (L.f.) Spreng. Fabaceae	Rheumatism, Tuberculosis, nervous affections, haemoptysis, catarrh, febrifuge [37]	Tropical world
<i>Terminalia bellirica</i> (Gaertn.) Roxb. Combretaceae	Fruit brain tonic; in piles, dropsy, fever, Leprosy [36]	Southeast Asia
<i>Terminalia catappa</i> L. Combretaceae	Bark diuretic; in dysentery, leaf in ointment of skin affection [37]; bark in Leprosy [47]	Tropical Asia, Africa, Australia
<i>Terminalia pallida</i> Brandis. Combretaceae	Bark diuretic [37]; fruit antimicrobial [158]	Indian subcontinent
<i>Terminalia sericea</i> Burch. ex DC. Combretaceae	Root sap and bark antiseptic; wounds, Leprosy, snakebites [80,88]	Southern Africa
<i>Tetracera indica</i> (Christm. & Panz.) Merr. Dilleniaceae	Shoots in pulmonary hemorrhage, gargle in aphthae; leaf and shoot in itches [37]	Myanmar, Thailand, Malaysia, Indonesia
<i>Tetracera scandens</i> (L.) Merr. Dilleniaceae	Burns and boils [37]	China to Malaysia, Indonesia, Philippines

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Tetragonia tetragonoides</i> (Pallas) Kuntze. Aizoaceae	Pulmonary and intestinal affections, stomach cancer [37]	Far East, parts of Australia, New Zealand
<i>Teucrium scordium</i> L. Lamiaceae	Stimulant, antiseptic, Phthisis, cough, piles, lupus, actinomycosis [37]	Euro Siberian area
<i>Thecostele alata</i> (Roxb.) C.S.P. Parish & Rchb.f. Orchidaceae	Pseudobulbs in ulcers [37]	Tropical Asia
<i>Thespesia acutiloba</i> (Baker f.) Exell & Mendonca. Malvaceae	Bark in skin ailments [80]	Some African countries
<i>Thespesia populnea</i> (L.) Sol. ex Corrêa. Malvaceae	Cutaneous affections, dysentery, hemorrhoids [37]	Pantropical distribution
<i>Thevetia nerifolia</i> Juss. Apocynaceae	Bark febrifuge, root in tumours, seed in rheumatism, dropsy [37]; leaf, bark antibacterial [40]	Mexico and Central America
<i>Thymus serpyllum</i> L. Lamiaceae	Essential oil antimicrobial [159]	Europe and north Africa
<i>Thymus vulgaris</i> L. Lamiaceae	Oil antiseptic; in gargles, whooping cough, bronchitis [37]; leaf and flower antimicrobial [54]	Southern Europe
<i>Tinospora crispa</i> (L.) Hook.f. & Thomson. Menispermaceae	Tonic, febrifuge, analgesic, urinary diseases, jaundice, rheumatism, Leprosy [37]	China, India to Malaysia
<i>Tinospora sinensis</i> (Lour.) Merr. Menispermaceae	Tonic, febrifuge, analgesic, urinary diseases, jaundice, rheumatism, Leprosy [37]	India, China
<i>Tithonia diversifolia</i> (Hemsl.) A.Gray. Asteraceae	Flower heads in wounds and bruises [37]	Mexico and Central America

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Toddalia asiatica</i> (L.) Lam. Rutaceae	Root bark tonic, antipyretic, antimalarial, diarrhoea, pain of bowel [37]	Africa and Asia
<i>Torenia polygonoides</i> Benth. Linderniaceae	Sores, ulcers and dropsy [37]	Indonesia to Malaysia, Oceania
<i>Torenia travancorica</i> Gamble. Linderniaceae	Leaf in Gonorrhoea [37]	Peninsular India, Sri Lanka
<i>Tovara virginiana</i> (L.) Raf. Polygonaceae	Tonic, diuretic, vulnerary [37]	Eastern North America
<i>Trachylobium verrucosum</i> (Gaertn.) Oliv. Fabaceae	Resin diuretic; in ointment for wounds [37]	Tropical East Africa
<i>Tribulus alatus</i> Delile. Zygophyllaceae	Diuretic, tonic, genito - urinary disorders, used to ensure fecundity of women [37]	Worldwide
<i>Tribulus terrestris</i> L. Zygophyllaceae	Fruit tonic, diuretic, painful micturition, calculous affections [37]; in Leprosy [44]	Worldwide
<i>Trichilia emetica</i> Vahl. Meliaceae	Leaf and fruit in bruises, eczema and wounds [125]	Tropical and south Africa
<i>Tricholepis glaberrima</i> DC. Asteraceae	Antiseptic, skin troubles, nervine tonic, urinary troubles, cough, seminal debility [37]	India
<i>Trichosanthes bracteata</i> (Lam.) Voigt. Cucurbitaceae	Fruit in sores, root in carbuncles and lung inflammation of animals [37]	India to Malaysia
<i>Trichosanthes cordata</i> Wall. Cucurbitaceae	Root tonic, in enlargement of liver, spleen; visceral organ disorder, Leprosy [37]	India to Malaysia
<i>Trichosanthes cucumerina</i> L. Cucurbitaceae	Root in bronchitis, leaf in baldness, to assist liver, seed febrifuge [37]	South and Southeast Asia

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Trichosanthes dioica</i> Roxb. Cucurbitaceae	Leaf in haemoptysis, oedema; root as purgative, excretion of accumulated toxins [41]	Tropical Asia
<i>Tridax procumbens</i> L. Asteraceae	Leaf in bronchial catarrh, dysentery, diarrhoea, haemorrhage [37]; wound healing [160]	Tropical Americas
<i>Trifolium pretense</i> L. Fabaceae	Flower in corns, cancerous ulcers; herb in sore eyes, burn [37]; potential antioxidant [161]	Europe, west Asia
<i>Triumfetta rhomboidea</i> Jacq. Malvaceae	Root in dysentery, intestinal ulcers, quickening delivery; leaf and flower in Leprosy [37]	Tropical regions of world
<i>Tropaeolum majus</i> L. Tropaeolaceae	Infection of urinary and respiratory organs, sores, itches [37]	Andes from Bolivia north to Colombia
<i>Tropaeolum minus</i> L. Tropaeolaceae	Infection of urinary and respiratory organs, sores, itches [37]	South America
<i>Turbina oblongata</i> (E. Mey. ex Choisy) A. Meeuse. Convolvulaceae	Leaf in sores and abscesses [88]	African countries
<i>Turraea villosa</i> Benn. Meliaceae	Roots in fistula and Leprosy [37]	India to Malaysia
<i>Tussilago farfara</i> L. Asteraceae	Styptic; leave diuretic, in cough, cold, asthma, rheumatism; flower in eye troubles [37]	Europe, parts of western and central Asia
<i>Tylophora fasciculata</i> Thwaite. Asclepiadaceae	Leaf on ulcers and wounds; root febrifuge [37]	India, Sri Lanka
<i>Tylophora indica</i> (Burm. f.) Merr. Apocynaceae	Root stimulant; in asthma, bronchitis, whooping cough, dysentery, diarrhoea, gouty pains [37]	India to Malaysia
<i>Typha elephantina</i> Roxb. Typhaceae	Rhizome diuretic, in dysentery, measles [37]; in Leprosy, wounds [44]	North Africa, west and south east Asia

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Uraria crinita</i> (L.) Desv. ex DC. Fabaceae	Diarrhoea, dysentery, enlargement of liver, spleen, pustules, tumours, fistula [37]	China, India to Malaysia, Australia
<i>Uraria picta</i> (Jacq.) Desv. ex DC. Fabaceae	Root in cough, fever; root and pod in anal prolapse of children, pod in sore mouth [37]	Africa, south and southeast Asia, Australia
<i>Urena lobate</i> L. Malvaceae	Flower expectorant; in aphthae, sore throat [37]	Tropics of both hemispheres
<i>Urena sinuata</i> L. Malvaceae	Leaf in inflammation of intestine and bladder, flower in bronchitis [37]	Tropical and subtropical areas
<i>Urginea indica</i> (Roxb.) Kunth. Asparagaceae	Bulbs stimulant, expectorant, diuretic, dropsy, rheumatism, skin troubles, warts, corns [37]	South Asia to south Africa
<i>Urginea maritima</i> (L.) Baker. Asparagaceae	Expectorant, in dermatitis [45]	Parts of Europe, Asia and America
<i>Urtica dioica</i> L. Urticaceae	Uterine haemorrhage, epistaxis, rheumatism, hepatitis, cholangitis, diuretic, diarrhoea [37]	Part of Europe, Asia, Africa, America
<i>Urtica pilulifera</i> L. Urticaceae	Leaf antimicrobial [67]	Europe
<i>Usnea intermedia</i> (A. Massal.) Jatta. Parmeliaceae	Aerial part antimicrobial [162]	North America
<i>Usnea filipendula</i> Stirt. Parmeliaceae	Aerial part antimicrobial [162]	North America
<i>Usnea fulvoreagens</i> (Rasanen) Rasanen. Parmeliaceae	Aerial part antimicrobial [162]	North America
<i>Usnea longissimi</i> Ach. Parmeliaceae	Expectorant and in ulcers in China [37]	Coastal Europe, Asia, North America

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Usnea sikkimensis</i> Biswas. Parmeliaceae	Lung troubles, hemorrhages, asthma [37]	Sikkim, India
<i>Utricularia caerulea</i> L. Lentibulariaceae	Dressing of wounds [37]	Tropical Africa, Asia, Australia
<i>Uvaria narum</i> Wall. Annonaceae	Root bark in rheumatism, bowel complaints, eczema; leaf in jaundice, fever [37]	South India, Sri Lanka
<i>Vaccinium oxycoccos</i> L. Ericaceae	Fruit antimicrobial [163]	Cool temperate northern hemisphere
<i>Vaccinium macrocarpon</i> Aiton. Ericaceae	Fruit antimicrobial [163]	North America
<i>Vallisneria spiralis</i> (L.) Kuntze. Cyperaceae	Latex on wounds and sores [37]	India, Myanmar, Sri Lanka
<i>Vanda parviflora</i> Lindl. Orchidaceae	Leaves on cuts, wounds, ear ache [37]	India, Myanmar, Sri Lanka
<i>Vanda tessellata</i> (Roxb.) Hook. ex G. Don. Orchidaceae	Leaf juice in otitis, root bronchitis, rheumatism, fever [37]	Indian subcontinent to Indochina
<i>Vateria indica</i> L. Dipterocarpaceae	Resin tonic; in bronchitis, throat troubles, piles, diarrhea, rheumatism, Tuberculosis, boils [37]	India
<i>Vepris bilocularis</i> (Wight & Arn.) Engl. Rutaceae	Wood oil in rheumatism, asthma, Leprosy; root in liver problems [37]	Southern Western Ghats, India
<i>Verbascum coromandelianum</i> (Vahl.) Kuntze. Scrophulariaceae	Febrifuge, in skin eruption; leaf in diarrhoea, dysentery [37]	Afghanistan to Thailand
<i>Verbascum sinaiticum</i> Benth. Scrophulariaceae	Leaf in fungal infections and wounds [69,149]	Northern Africa, Iran to Afghanistan

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Verbascum thapsus</i> L. Scrophulariaceae	Leaf and fruit in diarrhea, pulmonary diseases of animals; root febrifuge, oil in frost bite, piles, ring worm [37]; antimicrobial [164]	Europe, Africa, Asia, Americas, Australia
<i>Verbena officinalis</i> L. Verbenaceae	Liver complains, eczema, cold, fever, bronchitis; leaf in rheumatism, wounds [37]	Europe
<i>Vernonia adoensis</i> Sch. Bip. ex Walp. Asteraceae	Flower in Scabies and other skin diseases [88]	Some African countries
<i>Vernonia cinerea</i> (L.) Less. Asteraceae	Root in diarrhea, stomach ache, cough, colic; flower in fever, rheumatism, conjunctivitis; seed in cough, colic, leukoderma, psoriasis and other skin diseases [37]	Pantropic
<i>Vernonia schimperii</i> DC. Asteraceae	Leaf antimicrobial [66]	Ethiopia, Yemen, Saudi Arabia
<i>Vernonia teres</i> Wall. Compositae	Ulcers, wounds, dropsy, dysmenorrhea [37]	Tropical Himalayas, India
<i>Veronica beccabunga</i> L. Plantaginaceae	Diuretic, urinary troubles, scurvy, scrofulous and other skin affections [37]	Europe, Africa, north and western Asia
<i>Viburnum colebrookianum</i> Wall. ex DC. Caprifoliaceae	Leaf on old sores [37]	Eastern Himalayan region
<i>Venidium arctotoides</i> (L.f.) Less. Asteraceae	Leaf in wounds [81]	South Africa
<i>Vigna unguiculate</i> (L.) Walp. Fabaceae	Seed, root and leaf in wound healing [92]	Semi-arid regions
<i>Vinca minor</i> L. Apocynaceae	Leaf in diarrhoea, dysentery, Tuberculosis [37]	Central and southern Europe
<i>Viola patrinii</i> DC. Violaceae	Ulcers, foul sores, Syphilis; in cancer in Chinese medicine; flower in coughs and colds [37]	Japan, Korea, Mongolia, Russia

Contd...

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Viola tricolor</i> L. Violaceae	Stimulant, diuretic, diseases of blood, skin, rheumatism, expectorant, asthma [37]	Himalayan regions, Europe, North America
<i>Viscum articulatum</i> Burm. f. Santalaceae	Febrifuge, paste on cuts [37]	India to Malaysia
<i>Viscum capense</i> L.f. Santalaceae	Warts and other skin complaints [88]	South Africa
<i>Vitex altissima</i> L.f. Lamiaceae	Stem bark in wound [65]	India to Malaysia
<i>Vitex lucens</i> Kirk. Lamiaceae	Leaf in sprains, ulcers, sore throat [37]	New Zealand
<i>Vitex negundo</i> L. Lamiaceae	Root tonic, febrifuge, diuretic, in rheumatism, dysentery, piles; flowers in diarrhoea, fever, liver complaints [37]; in skin diseases [63]	South and Southeast Asia
<i>Vitex peduncularis</i> Wall. ex Schauer. Lamiaceae	Leaf and bark in Malaria and black water fever; leave antibacterial [37]	India to Malaysia
<i>Vitex pinnata</i> L. Lamiaceae	Leaf on wounds [37]	South and Southeast Asia
<i>Vitex trifolia</i> L. Lamiaceae	Leaf in Tuberculosis, leaf and root febrifuge [37]	Coastlines of tropical east Africa
<i>Vitis vinifera</i> L. Vitaceae	Sap in skin affections [37]	Mediterranean region, southwestern Asia
<i>Voacanga foetida</i> (Blume) Rolfe. Apocynaceae	Latex in fistulae, tumours, pustules, stomach and intestinal troubles [37]	Indonesia, Malaysia, Philippines
<i>Wagatea spicata</i> (Dalzell) Wight. Fabaceae	Root in pneumonia, bark in skin troubles [37]	India

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Wahlenbergia marginata</i> (Thunb.) A. DC. Campanulaceae	Herb in skin troubles, root in pulmonary infections [37]	Asia, Australia, New Zealand
<i>Waltheria indica</i> L. Malvaceae	Root in internal hemorrhages, thrush [37]; used in wounds [70]	Central and South America
<i>Warburgia salutaris</i> (Bertol.f.) Chiov. Canellaceae	Bark in skin complaints [88]	Southern Africa
<i>Wedelia biflora</i> (L.) DC. Asteraceae	Leaf diuretic, on cuts, ulcers, sores, varicose veins [37]	Tropical belt of the Indo-Pacific region
<i>Wedelia chinensis</i> (Osbeck) Merr. Compositae	Aerial part in skin diseases [63]	South east Asian countries
<i>Wedelia wallichii</i> Less. Asteraceae	Herb poultice on wounds [37]	India
<i>Woodfordia fruticosa</i> (L.) Kurz. Lythraceae	Flower, leaf and fruit gum antimicrobial [40]	India
<i>Wrightia tinctoria</i> (Roxb.) R. Br. Apocynaceae	Bark in diarrhoea, piles, ringworm and skin diseases, fever; seed anthelmintic, astringent [41]	India, southeast Asia, Australia
<i>Xanthium spinosum</i> L. Asteraceae	In Hydrophobia and intermittent fevers [37]	Worldwide distribution
<i>Xanthium strumarium</i> L. Asteraceae	Chronic Malaria, leucorrhoea, urinary diseases; leaf diuretic, anti-syphilitic, in herpes; root tonic, in cancer, ulcers, boils, abscesses [37]	North America
<i>Ximenia caffra</i> Sond. Olacaceae	Root in wound difficult to heal, septic sores [70, 125]	Eastern and southern Africa
<i>Ximenia americana</i> L. Olacaceae	Root febrifuge; in venereal diseases, jaundice, diarrhea, bark in sores [37]	Pantropical

Plant (with Family)	Plant parts used as/in	Native habitat
<i>Xylia xylocarpa</i> Roxb. Taub. Fabaceae	Bark in Gonorrhea and diarrhea [37]	South and southeast Asia
<i>Xyris complanata</i> R.Br. Xyridaceae	Herb antiseptic, in itches, ring worm, Leprosy [37]	China, India to Malaysia, Australia
<i>Xyris indica</i> L. Xyridaceae	Itch, ringworm, Leprosy [37]	India to Malaysia
<i>Xysmalobium undulatum</i> (L.) W.T. Aiton. Apocynaceae	Root in sores, wounds and abscesses [80,88]	Africa
<i>Yucca gloriosa</i> L. Asparagaceae	Rheumatism, sores, ulcers, dysentery, Phthisis, bronchitis, Hemorrhagic septicemia [37]	South-eastern United States
<i>Zanonia indica</i> L. Cucurbitaceae	Fruit antiseptic, in cough, asthma [37]	South and southeast Asia
<i>Zantedeschia aethiopica</i> (L.) Spreng. Araceae	Leaf in wounds, boils, sores [79,80]	Southern Africa
<i>Zanthoxylum capense</i> (Thunb.) Harv. Rutaceae	Leaf in sores [88]	Eastern regions of southern Africa
<i>Zanthoxylum armatum</i> DC. Rutaceae	Fruit oil antiseptic, used in dental preparations [37]	China, India to Malaysia
<i>Zanthoxylum limonella</i> (Dennst.) Alston. Rutaceae	Fruit in asthma, bronchitis, rheumatism, tooth ache; oil antiseptic; in Cholera, dermatosis [37]	India to Malaysia
<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm. Zingiberaceae	Rhizome in cough, asthma, Leprosy, skin diseases [37]	India
<i>Ziziphus mucronata</i> Willd. Rhamnaceae	Leaf, root and bark in boils, sores, swellings [80,88]	Southern Africa
<i>Ziziphus mauritiana</i> Lam. Rhamnaceae	Fruit antimicrobial [165]; in heart problems, seed in dysmenorrhea, stem cover in bloody amoebiasis [41]	Pleotropic

Chapter XVI

BIBLIOGRAPHY

- [1] Lonnroth K, Williams BG, Cegielski P, Dye C. A consistent log-linear relationship between tuberculosis incidence and body mass index. *Int J Epidemiol* 2010; 39(1):149-55.
- [2] Onal CO, Kibaroglu E. Pulmonary Tuberculosis caused by immunosuppressive treatment. *J Clinical Case Reports* 2014; 4(7): 1-3.
- [3] Pattanayak S. Alternative to antibiotics - preparation for post antibiotic era. *Explor Anim Med Res* 2017; 7(1): 05-10.
- [4] Pattanayak S. Development of resistance in bacteria against Anti - microbial agents: reasons, threats and ongoing encounter. *Explor Anim Med Res* 2011; 1(1): 07-19.
- [5] Rang HR, Dale MM, Ritter JM, Moore PK. *Pharmacology*, 6th. ed. Churchill-Livingstone (Elsevier). 1992.
- [6] Jamal M, Tasneem U, Hussain T, Andleeb S. Bacterial biofilm: its composition, formation and role in human infections. *Research & Reviews: J Microbiol Biotechnol* 2015; 4(3): 01-14.
- [7] Pattanayak S. Processed foods – are they safe? *Explor Anim Med Res* 2017; 7(2): 125-31.
- [8] Ogino S, Chan AT, Fuchs CS, Giovannucci E. Molecular pathologic epidemiology of colorectal neoplasia: an emerging transdisciplinary and interdisciplinary field. *Gut* 2011; 60(3): 397-11.
- [9] Ogino S, Nishihara R, Tyler J, *et al.* The Role of molecular pathological epidemiology in the study of neoplastic and non-neoplastic diseases in the era of precision medicine. *Epidemiology* 2016; 27(4): 602-11.
- [10] Ogino S, Jhun I, Mata DA, *et al.* Integration of pharmacology, molecular pathology, and population data science to support precision gastrointestinal oncology. *npj Precision Oncology* 2017; 1: 40.

- [11] Lin JH, Giovannucci E. Environmental exposure and tumor heterogeneity in colorectal cancer risk and outcomes. *Curr Colorectal Cancer Rep* 2014; 10: 94-04.
- [12] Joy PP, Thomas J, Mathew S, Skaria BP. *Medicinal Plants*. Kerala Agricultural University, Kerala, India. 1998.
- [13] Ingle KP, Deshmukh AG, Padole DA, Dudhare MS, Moharil MP, Khelurkar VC. Phytochemicals: extraction methods, identification and detection of bioactive compounds from plant extracts. *J Pharmacog Phytochem* 2017; 6(1): 32-36.
- [14] Pattanayak S, Mandal TK, Bandyopadhyay SK. Validation and therapeutic use of succulent plant parts - opening of a new horizon of alternative medicine. *Explor Anim Med Res* 2016; 6(1): 8-14.
- [15] Pattanayak S, Maity D, Mitra S, Debnath PK, Mandal TK, Bandyopadhyay SK. Use of fresh parts of medicinal plants for health and production in livestock – a new concept of farming. *Expl Anim Med Res* 2013; 3(1): 7- 16.
- [16] Pattanayak S, Dutta MK, Debnath PK, Bandyopadhyay SK, Saha B, Maity D. A study on ethno-medicinal use of some commonly available plants for wound healing and related activities in three southern districts of West Bengal, India. *Explor Anim Med Res* 2012; 2(2): 97-110.
- [17] Pattanayak S. Alternative to antibiotics from herbal origin – outline of a comprehensive research project. *Current Pharmacogenomics and Personalised medicine* 2018; 16(1): 9 -62. DOI: 10.2174/1875692116666180419154033.
- [18] Thakur R, Jain N, Pathak R, Sandhu SS. Practices in wound healing studies of plants. *Evi Based Compl Alt Med* 2011, 2011:1-17.
- [19] Kumar B, Vijayakumar M, Govindarajan R, Pushpangadan P. Ethnopharmacological approaches to wound healing – exploring medicinal plants of India. *J Ethnopharmacol* 2007; 114:103-13.
- [20] Christen Yves. Oxidative stress and Alzheimer disease *Am J Clin Nutr* 2000; 71(suppl):621S–9S.
- [21] Davì G, Falco A, Patrono C. Lipid peroxidation in diabetes mellitus. *Antioxid Redox Signal* 2005; 7(1-2):256-68.
- [22] Cosa P, Vlietinck AJ, Berghe DV, Maes L. Anti-infective potential of natural products: How to develop a stronger in vitro ‘proof-of-concept’. *J Ethnopharmacol* 2006; 106: 290–02.

- [23] Sasidharan S, Chen Y, Saravanan D, Sundram KM, Yoga Latha L. Extraction, isolation and characterization of bioactive compounds from plants' extracts. *Afr J Tradit Complement Altern Med* 2011; 8(1): 01-10.
- [24] Balouiri M, Sadiki M, Ibnsouda SK. Methods for in vitro evaluating antimicrobial activity: a review. *J Pharmaceut Analys* 2016; 6: 71-79.
- [25] Pattanayak S, Pal S, Mandal TK, Debnath PK, Bandyopadhyay SK. A comparative study of extract of succulent leaves of living plant with methanolic and aqueous extract of *Berleria lupulina* Lindl. against pathogenic microbes by disc diffusion and spectrophotometry. *Explor Anim Med Res* 2014; 4(2): 148-57.
- [26] Mahdi-Pour B, Subramanion LJ, Lachimanan YL, Chen Y, Sasidharan S. Antioxidant activity of methanol extracts of different parts of *Lantana Camara*. *Asian Pac J Trop Biomed* 2012; 2(12): 960-65.
- [27] Puri A, Srivastava A, Bhardwaj A, Tandon JS, Saxena KC. Immunostimulant activity of certain plants used in Indian traditional medicine. *J Medic plant res* 2013; 7(44): 3242-46.
- [28] Nayak S, Mengi S. Immunostimulant activity of the extracts and bioactives of the fruits of *Morinda citrifolia*. *Pharmaceut Biol* 2009; 47(3): 248–54.
- [29] Pratheepa V, Sukumaran N. Specific and nonspecific immunostimulation study of *Euphorbia hirta* on *Pseudomonas fluorescens*-infected *Cyprinus carpio*. *Pharmaceut Biol* 2011; 49(5): 484–91.
- [30] OECD guidelines for the testing of chemicals. Available from: http://www.oecd-ilibrary.org/environment/oecd-guidelines-for-the-testing-of-chemicals_chem_guide_pkg-en.
- [31] Phases of clinical trials. Canadian Cancer Society. Available from: (<http://www.cancer.ca/en/cancer-information/diagnosis-and-treatment/clinical-trials/phases-of-clinical-trials/?region=on>).
- [32] Begum D, Nath SC. Ethnobotanical review of medicinal plants used for skin diseases and related problems in Northeastern India, *J Herbs Spices Medici Plants* 2000; 7: 55–93.
- [33] Gupta A, Nagariya AK, Mishra AK, *et al*. Ethno-potential of medicinal herb in skin diseases: an overview. *J Pharm Res* 2010; 3(3): 435- 41.
- [34] Mabona U. Antimicrobial activity of southern African medicinal plants with

dermatological relevance. Dissertation submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, for the degree of Master of Pharmacy. 2013.

- [35] Jaiswal S, Singh SV, Singh B, Singh HN. Plants used for tissue healing in animals. *Nat Prod Rad* 2004; 3(4): 284-90.
- [36] Jain SK. Medicinal plants. National Book Trust, New Delhi, India. 1996.
- [37] Ambasta SP. The useful plants of India. National Institute of Science Communication and Information Resources. CSIR, New Delhi. 1986.
- [38] Wandrey C, Bartkowiak A, Harding SE. Materials for encapsulation. From: N.J. Zuidam and V.A. Nedoviæ (eds.), *Encapsulation Technologies for Active Food Ingredients and Food Processing*, Chapter 3, 2010; Springer Science, LLC.
- [39] Capsule (Pharmacy) Wikipedia. Accessed on 20.09.18
- [40] Dabur R, Gupta A, Mandal TK, *et al.* Antimicrobial activity of some Indian medicinal plants. *Afr J Tradit Compl Altern Medic.* 2007; 4(3): 313-18.
- [41] Bhattacheryya S. Chiranjib Banousodhi (Bengali) Part I and Part 2. (1976 -1977) Ananda Publishers Pvt. Ltd. Kolkata – 700009, India.
- [42] Smith CA. Common names of South African plants. *Memoirs of the Botanical Survey of South Africa*, 35th ed., Department of Agricultural Technical Services, Pretoria, South Africa 1996.
- [43] Chaturvedi D, Shrivastava RR, Suhane N. Basketful benefit of Citrus limon. *Int Res J Pharmacy* 2016; 7(6): 1-4.
- [44] Kirtikar KR, Basu BD. *Indian Medicinal Plants*. Vol. 1- 4, Lalit Mohan Basu, Allahabad, India. 1935.
- [45] Sunilchandra U, Vijaykumar M, Sravanthi P. Phytomedicines in Veterinary practice. *North East Vet* 2008; 8(2): 4-7.
- [46] Roychowdhury R. The healing powers of herbs. Mumbai, Pantaloons Retail India Ltd; 2008.
- [47] Chopra RN, Nayar SL, Chopra RC. *Glossary of Indian Medicinal Plants*, Council of Scientific and Industrial Research, New Delhi, India, 1956.
- [48] Kumar V, Thakur AK, Barothia ND, Chatterjee SS. Therapeutic potentials of *Brassica juncea*: an overview. *TANG Humanitus Medicine* 2011; 1(1) / e2

- [49] Cichewicz RH, Thorpe PA. The antimicrobial properties of chile peppers (*Capsicum* species) and their uses in Mayan medicine. *J Ethnopharmacol* 1996; 52(2): 61-70.
- [50] Ranasinghe P, Pigera S, Premakumara GAS, Galappaththy P, Constantine GR, Katulanda P. Medicinal properties of ‘true’ Cinnamon (*Cinnamomum zeylanicum*): a systematic review. *BMC Complement Altern Med* 2013; 13: 275.
- [51] Bhargava KV. Medicinal uses and pharmacological properties of *Crocus sativus* Linn. (Saffron). *International J Pharmacy Pharmaceut Sci* 2011; 3 (Suppl 3): 21-26.
- [52] Rather MA, Dar BA, Sofi SN, Bhat BA, Qurishi MA *et al.* Foeniculum vulgare: A comprehensive review of its traditional use, phytochemistry, pharmacology, and safety. *Arabian J Chemistry* 2012; 9(Suppl2): S1574-S1583.
- [53] Zhang L, Lokeshwar BL. Medicinal properties of the Jamaican pepper plant *Pimenta dioica* and Allspice. *Curr Drug Targets* 2012;13(14):1900-06.
- [54] Nascimento GGF, Locatelli J, Freitas PC, Silva GL. Antibacterial activity of plant extracts and phytochemicals on antibiotic resistant Bacteria. *Brazilian J Microbiology* 2000; 31: 247-56.
- [55] Bhattarai NK. Folk use of plants in Veterinary Medicine in Central Nepal. *Fitoterapia* 1992; 63: 497-06.
- [56] Mishra JN, Verma NK. A brief study on *Catharanthus Roseus*: A review. *Intern J Res Pharmacy Pharmaceut Sci* 2017; 2(2): 20- 23.
- [57] Bhowmick R, Sarwar MS, Dewan SMR, Das A, Das B, Uddin MMU *et al.* *In vivo* analgesic, antipyretic, and anti-inflammatory potential in Swiss albino mice and *in vitro* thrombolytic activity of hydroalcoholic extract from *Litsea glutinosa* leaves. *Biol Res* 2014; 47(56):1-8.
- [58] Palla AH, Khan NA, Bashir S, Ur-Rehman N, Iqbal J, Gilani AH. Pharmacological basis for the medicinal use of *Linum usitatissimum* (Flaxseed) in infectious and non-infectious diarrhea. *J Ethnopharmacol.* 2015; 160:61-8. doi: 10.1016/j.jep.2014.11.030.
- [59] Pan An, Yu Danxia, Demark-Wahnefried Wendy, Franco Oscar H., Lin Xu. Meta-analysis of the effects of flaxseed interventions on blood lipids. *The American Journal of Clinical Nutrition.* 2009; 90 (2):288–97. doi:10.3945/ajcn.2009.27469.

- [60] Pattanayak S, Mandal TK, Bandyopadhyay SK. Ethnomedicinal study of plants used for protection and stimulation of liver in southern West Bengal, India. *Explor Anim Med Res* 2016; 6(2): 164 - 78.
- [61] Doughari JH. Antimicrobial activity of *Tamarindus indica* Linn. *Tropical J Pharmaceut Res* 2006; 5(2): 597- 03.
- [62] Pinar Kuru. *Tamarindus indica* and its health-related effects, *Asian Pac J Trop Biomed* 2014; 4(9): 676-81.
- [63] Biswas TK, Mitra A, Hazra A, Paul S, Debnath PK. Medicinal plants used in Ayurveda. National Medicinal Plants Board, Govt.of India. 2009.
- [64] Bhatt DC, Mitaliya KD, Mehta SK, Joshi PN. Notes on some ethnomedicinal plants of Paccham Hills of Kachh district, Gujarat *Ethnobotany* 2002; 14: 34 - 35.
- [65] Jeevan Ram A, Bhakshu LM, Venkata Raju RR. *In vitro* antimicrobial activity of certain medicinal plants from Eastern Ghats, India, used for skin diseases, *J Ethnopharmacol* 2004; 90: 353-57.
- [66] Abdel-Sattar E, Harraz FM, Sabah HEL, Gayed SHE. Antimicrobial activity of extracts of some plants collected from the kingdom of Saudi Arabia. *J King Abdulaziz University Med Sci* 2008; 15(1): 25-33.
- [67] Obeidat M, Shatnawi M, Al-alawi *et al.* Antimicrobial activity of crude extracts of some plant leaves. *Res J Microbiol* 2012; 7(1): 59-67.
- [68] PerumalSamy RP, Ignacimuthu S, Sen A. Screening of 34 Indian medicinal plants for antibacterial properties. *J Ethnopharmacol* 1998; 62:173-82.
- [69] Tadege H, Mohammed E, Asres K, Gebre-Mariam T. Antimicrobial activities of some selected traditional Ethiopian medicinal plants used in the treatment of skin disorders. *J Ethnopharmacol* 2005; 100:168-75.
- [70] Von Koenen E. Heil-Gift-und, Essbare, P. flenzen in Namibia. *KlaussHees Verlag, Göttingen, Namibia.* 1996.
- [71] Doherty VF, Olaniran OO, Kanife UC. Antimicrobial Activities of *Aframomum Melegueta* (Alligator Pepper). *Intern J Biol* 2010; 2(2): 126 -31.
- [72] Jain SK. Dictionary of Indian folk medicine and ethno botany - a reference manual of man - plant relationships. In: Jain SK. *Ethnic groups and Ethno botanists in India.* New Delhi: Deep Publications 1991; 311.

- [73] Koné WM, Atindehou KK. Ethnobotanical inventory of medicinal plants used in traditional Veterinary medicine in Northern Côte d'Ivoire (West Africa). *South African J Botany* 2008; 74: 76 - 84.
- [74] Augustine T, Sivadasan M. Ethnomedicinal plants of Periyar Tiger Reserve, Kerala, India. *Ethnobotany* 2004; 16: 40 - 43.
- [75] Gaur RD, Bhat KC, Tiwari JK. An ethnobotanical study of Uttar Pradesh Himalaya in relation to Veterinary Medicines. *J Indian Bot Soc* 1992; 72: 139-44.
- [76] Boily Y, van Puyvelde L. Screening of medicinal plants of Rwanda (Central Africa) for antimicrobial activity. *J Ethnopharmacology* 1986; 16: 01-13.
- [77] Okeke IN, Ogundaini AO, Ogungbamila FO, Lamikanra A. Antimicrobial spectrum of *Alchornea cordifolia* leaf extract. *Phytother Res* 1999; 13(1): 67-69.
- [78] Augusti KT. Therapeutic values of onion (*Allium cepa* L.) and garlic (*Allium sativum* L.). *Indian J Exp Biol* 1996; 34(7): 634-40.
- [79] Van Wyk BE, van Oudtshoorn B, Gericke N. Medicinal Plants of South Africa, 2nd edn. Briza, Pretoria, South Africa; 2000.
- [80] Wat JM, Breyer-Brandwijk MG. The medicinal and poisonous plants of Southern and Eastern Africa, 2nd edn. London; Livingstone 1962.
- [81] Smith A. A Contribution to the South Africa Material Medica, 3rd edn. Lovedale, South Africa; 1895.
- [82] Nayak S, Behera SK, Nishha M. Ethno medico botanical survey of Kalahandi district of Orissa, *Indian J Trad Knowld* 2004; 3: 72-79.
- [83] Bhandary MJ, Chandrasekhar KR. Glimpses of ethnic herbal medicine of coastal Karnataka, *Ethnobotany* 2002; 14: 01-12.
- [84] Vucic DM, Petkovic MR, Rodic-Grabovac BB, Vasic SM, Comic LR. *In vitro* efficacy of extracts of *Arctostaphylos uva ursi* L on clinical isolated *Escherichia coli* and *Enterococcus faecalis* strains. *Kragujevac J Sci* 2013; 35: 107-13.
- [85] Girach RD. Ethno medicinal uses of plants among tribals of Singhbhum district, Bihar, India. *Ethnobotany* 1995; 7: 103-07.
- [86] Ngwenya MA, Koopman A, Williams R. Zulu botanical knowledge: an introduction. National Botanical Institute, Durban, South Africa; 2003.
- [87] Nguyen NM, Gonda S, Vasas G. A review on the phytochemical composition and

potential medicinal uses of Horseradish (*Armoracia rusticana*) root. Food Reviews International 2013; 29(3): 261-75.

- [88] Hutchings A. Zulu medicinal plants. University of Natal Press. Pietermaritzburg, South Africa; 1996.
- [89] Jain SP, Puri HS. An ethno-medico-botanical survey of Parbati Valley in Himachal Pradesh (India), J Econ Taxon Botany 1994; 18(2): 321-27.
- [90] Okoli CO, Akah PA, Okoli AS. Potentials of leaves of *Aspilia africana* (Compositae) in wound care: an experimental evaluation. BMC Complement Altern Med 2007; 7(24): 01-07.
- [91] Gupta V, Bansal P, Bansal R, Mittal P, Kumar S. Folklore herbal remedies used in dental care in Northern India and their pharmacological potential. American J Ethnomedic 2015; 2(6): 365-72.
- [92] Annon. The Wealth of India, a dictionary of Indian raw materials and industrial products. Vol two, Council of Scientific and Industrial Research, New Delhi, 1950.
- [93] Taylor RSL, Edel F, Manandhar NP, Towers GHN. Antimicrobial activities of southern Nepalese medicinal plants, J Ethnopharmacol 1996; 50: 97-02.
- [94] Bernstein S, Donsky H, Gulliver W, Hamilton D, Nobel S, Norman R. Treatment of mild to moderate Psoriasis with Relieva, a *Mahonia aquifolium* extract – a double blind, placebo – controlled study. American j therapeutics 2006; 13(2): 121-26.
- [95] Recio MC, Rios JL, Villar A. Antimicrobial activity of selected plants employed in the Spanish Mediterranean area. Part II, Phytotherp Res 1989; 3: 77–80.
- [96] Vogl S, Picker P, Mihaly-Bison J, *et al.* Ethnopharmacological in vitro studies on Austria's folk medicine - an unexplored lore in vitro anti-inflammatory activities of 71 Austrian traditional herbal drugs. J Ethnopharmacol 2013; 149: 750 - 71.
- [97] Jain V, Verma SK. Assessment of credibility of some folk medicinal claims on *Bombax ceiba* L. Indian j Trad Knowld 2014; 13(1): 87 - 94.
- [98] Sharma SK. Medicinal plants used in Ayurveda. National Academy of Ayurveda, Ministry of Health and Family Welfare, Govt. of India, New Delhi, India; 1998.
- [99] Jagtap SD, Deokule SS, Bhosle SV. Some unique ethnomedicinal uses of plants used by the Korku tribe of Amravati district of Maharashtra, India. J Ethnopharmacol 2006; 107: 463 - 69.

- [100] Rabe T, Van Staden JV. Antibacterial activity of South African plants used for medicinal purposes. J Ethnopharmacol 1997; 56: 81-87.
- [101] Srivastava PP, Chandrapuria VP, Bharagava MK, Kushwah A. Biochemical alteration in healing tissue with herbal preparations. Indian J Vet Surgery 2000; 21(2): 79-81.
- [102] Umaiyambigai D, Saravanakumar K, Raj GA. Phytochemical profiles, antibacterial and antifungal activity of leaves from the *Psyrdrax dicoccos* Garten. Indo Asian J Multidisciplinary Res 2015; 2(1): 443 - 52.
- [103] Lather A, Chaudhury AK, Gupta V, Bansal P, Bansal R. Phytochemistry and pharmacological activities of *Capparis zeylanica*: an overview. Int I Res Ayu Pharm 2010; 1(2): 383- 89.
- [104] Girach RD, Ahmed A. Medical ethnobotany of Sundargarh, Orissa, India. Pharmaceutical Biol 1998; 36: 20 - 24.
- [105] Jain SK, Banerjee DK, Pal DC, Medicinal plants among certain Adibasis in India, Bulletin of Botanic Surv, India, 1973; 15: 85 - 91.
- [106] Murthy LKNC, Vanitha A, Swamy MM, Ravishankar GA. Antioxidant and antimicrobial activity of *Cissus quadrangularis*. J Medicinal Food 2003; 6: 99 - 05.
- [107] Faleye FJ, Ogundaini AO, Olugbade AT. Antibacterial and antioxidant activities of *Citrus paradise* (Grapefood seed) extreacts. J. Pharmaceut Scientific Innova 2012; 1(3): 63 - 66.
- [108] Hosagounder VB, Henry AN. Ethnobotany of Soligas in Siliguir, Ranganabetta, Karnataka, southern India. J Econom Taxonom Botany, Addl Series 1996; 12: 82 - 91.
- [109] Ganesan S, Kesaven L. Ethnomedicinal plants used by the ethnic group of Valaiyans of Vellimalai Hills (Reserved forest) Tamil Nadu, India. J Econom Taxonom Botany 2003; 27: 754 - 60.
- [110] Meena MK, Singh N, Patni V. Determination of bioactive components of the leaves of *Cocculu shirsutus* (L.) Diels. using GC-MS analysis. Int J Pharm Pharm Sci 2014; 6 (S-2): 327- 29.
- [111] DebMandal M, Mandal S. Coconut (*Cocos nucifera* L.: Arecaceae): In health promotion and disease prevention. Asian Pacific J Tropic Medicine 2011; 2011: 241-47.

- [112] DuttaPramanick D. Pharmacognostic studies on the pseudobulb of *Coelogyne cristata* Lindl. (Orchidaceae) - an epiphytic orchid of ethno-medicinal importance. J Pharmacognosy Phytochemistry 2016; 5(1): 120-23.
- [113] Masoko P, Picard J, Eloff JN. The antifungal activity of twenty-four southern African *Combretum* species (Combretaceae). South African J Botany 2007; 73: 173 - 83.
- [114] Lemenih M, Teketay D. Frankincense and Myrrh resources of Ethiopia: II. Medicinal and industrial uses. Ethiop J Sci 2003; 26(2): 161-72.
- [115] Anani K, Hudson JB, de Souza C, *et al.* Investigation of medicinal plants of Togo for antiviral and antimicrobial activities, Pharmaceut Biol 2000; 38: 40 - 45.
- [116] Maity D. A study on ethnomedicinal uses of Yartshagumba, *Cordyceps sinensis* (Berk.) Sacc. (Cordycipitaceae) by the tribal communities of North Sikkim and its conservation. Explor Anim Med Res 2013; 3(2): 95-01.
- [117] Asolkar LV, Kakkar KK, Chakre OJ. Second supplement to glossary of Indian medicinal plants with active principles. Part I (A-K) (1965-1981), CSIR, New Delhi, India; 1992.
- [118] Pattanayak S, Mandal TK, Debnath PK, Das AK, Bandyopadhyay SK. Comparative haemostatic efficacy of succulent leaf extracts and latex of some wound healing plants on fresh wound of rabbit. Explor Anim Med Res 2015; 5(1): 20-26.
- [119] Miller M. Inhibition of neurogenic inflammation by the Amazonian herbal medicine Sangre de grado. J Investigative Dermatol 2001; 117: 725 - 30.
- [120] Appiah AA. The Golden roots of *Cryptolepis sanguinolenta*, in African natural plant products: new discoveries and challenges in chemistry and quality. Centre for Scientific Research into Plant Medicine, Ghana, Chapter 13, 2009; 231 – 39.
- [121] Singh GS. Ethno botanical study of useful plants of Kulu district in N.W. Himalaya, India. J Econ Taxon Botany 1999; 23: 185 - 98.
- [122] Wang QH, Xiao HB, Yang BY, Yao FY, Kuang HX. Studies on pharmacological actions of the effective parts for psoriasis in Flos Daturae (I). Chinese J Exp Trad Med Formulae 2008; 14: 48-51.
- [123] Sharma HK, Chhangte L, Dolui AK. Traditional medicinal plants in Mizoram, India. Fitoterapia 2001; 72: 146 - 61.

- [124] Goldharber - Fiebert S, Kemper KJ. Echinacea (*E. angustifolia*, *E. palida*, *E. purpurea*). Longwood Herbal Task Force 1999; 1-16. Available from: <http://www.mcp.edu/herbal/default.html> [cited 16th July 2017].
- [125] Van Wyk B, van Wyk P, van Wyk BE. Photo guide to trees of Southern Africa. Briza, South Africa. 2011.
- [126] Van Wyk BE, van Oudtshoorn B, Gericke N. Medicinal plants of South Africa 3rd edn. Briza, South Africa; 2009.
- [127] Korikanthimathm VS, Prasath D, Rao G. Medicinal properties of *Elettaria cardamomum*. J medicinal aromatic crops 2001; 22/23: 683- 85.
- [128] Pal DC, Jain SK. Tribal Medicine, Calcutta, India; Naya Prakash Publishers 1997.
- [129] Olano I, Paz EA, Cerdas MP, *et al.* Screening of Uruguayan medicinal plants for antimicrobial activity. Part II, J Ethnopharmacol 1996; 53: 97 – 04.
- [130] Singh KK. Studies of native medicine of Jaunsari tribe of Dehradun District, U.P. India. Int J Pharmacognosy 1997; 35: 105 - 10.
- [131] Liu X, Zhang X, Lee K. Antimicrobial activity of the extracts of *Forsythia suspense* and *Dendranthema indicum*. Agric Chem Biotechnol 2005; 48(1): 29 - 31.
- [132] Rios JL, Recio MC, Villar A. Antimicrobial activity of selected plants employed in the Spanish mediterranean area. J Ethnopharmacol 1987; 21: 139 -52.
- [133] Damle M. *Glycyrrhiza glabra* (Liquorice) - a potent medicinal herb. Intern J Herbal Medic 2014; 2(2): 132 - 36.
- [134] Panda DC, Das P. Medicinal plant-lore of the tribals of Baliguda subdivision, Phulbain, District, Orissa, India. J Econ Taxon Botany 1999; 23: 515-21.
- [135] Asmi S, Lakshmi T. Therapeutic aspects of Goldenseal. Int Res J Pharm 2013; 4(9): 41-43.
- [136] Sakar MK, Tamer AU. Antimicrobial activity of different extracts from some *Hypericum* species, Fitoterapia 1990; 61: 464 - 66.
- [137] Mukherjee PK, Suresh B. The evaluation of wound-healing potential of *Hypericum hookerianum* leaf and stem extracts. J Altern Complement Med 2000; 6(1): 61-69.
- [138] Adhikari BS, Babu MM, Saklani PL, Rawat MM. Medicinal plant diversity and their conservation atatus in wildlife institute of India (WII) campus, dehradun. Ethnobotanical leaflets 2010; 14: 46-83.

- [139] Immel DL. Plant Guide for Virginia Iris (*Iris virginica* L.) USDA-Natural Resources Conservation Service, National Plant Data Center, Environmental Horticulture Department, University of California-Davis, 2001.
- [140] Tamiru F, Terfa W, Kebede E, Dabessa G, Roy RK, Sorsa M. Ethno knowledge of plants used in veterinary practices in Dabo Hana District, West Ethiopia. J Med Plants Res 2013; 7(40): 2960 -71.
- [141] Arteaga S, Andrade-Cetto A, Ardenas RC. *Larrea tridentata* (Creosote bush), an abundant plant of Mexican and US-American deserts and its metabolite nor dihydroguaiaretic acid. J Ethnopharmacol 2005; 98: 231- 39.
- [142] Prusinowska R, Ćemigielski KB. Composition, biological properties and therapeutic effects of lavender (*Lavandula angustifolia* L.) a review. Herba Polonica 2014; 60(2): 56-66.
- [143] Ghazanfar SA. Handbook of Arabian medicinal plants. Boca Raton, FL, CRC Press. 1994; 176.
- [144] Chopra RN, Chopra IC, Verma BS. Supplement to the glossary of Indian medicinal plants, Council of Scientific and Industrial Research, New Delhi, India; 1969.
- [145] Buli GA, Duga AG, Dessalegn E. Antimicrobial Activity of *Lippia adoensis* var. koseret against human pathogenic bacteria and fungi. American J Clinic Experiment Medic 2015; 3(3): 118 -23.
- [146] Moore KA, Fisher LE, Torre CJD, Gettys LA. Native aquatic and wetland plants: cardinal flower, *Lobelia cardinalis*. IAFS extension, University of Florida, USA (SS-AGR398). 2015. Available from: <https://edis.ifas.ufl.edu/pdf/AG/AG40200.pdf>.
- [147] Pattanayak S, Das P, Mandal TK, Debnath PK, Bandyopadhyay SK. A study on comparative anti microbial and wound healing efficacy of solvent extracts and succulent leaf extract of *Mikania scandens* (L.) Willd. Am J Phytomed Clinic Therapeut 2015; 3(4): 346 - 62.
- [148] Hashmi MA, Khan A, Hanif M, Farooq U, Perveen S. Traditional uses, phytochemistry and pharmacology of *Olea europaea* (Olive). Evidence Based Complement Altern Med 2015; 2015: 01-29.
- [149] Abebe D, Ayehu A. Medicinal plants and enigmatic health practices of northern Ethiopia, Addis Ababa, Ethiopia; 1993.

- [150] Wet HD, Sibongile Nciki S, van Vuuren SF. Medicinal plants used for the treatment of various skin disorders by a rural community in northern Maputaland, South Africa. *J Ethnobiol Ethnomed* 2013; 9: 51.
- [151] Tanaka Y, Nguyen VK. Edible wild plants of Vietnam: the bountiful garden. Thailand: Orchid Press 2007.
- [152] Roshan P, Naveen M, Manjul PS, Gulzar A, Anita S, Sudarshan S. *Plectranthus amboinicus* (Lour) Spreng.: an overview. *The Pharma Res* 2010; 4: 01-15.
- [153] Mokat DN, Deokule SS. Plants used as Veterinary medicine in Ratnagiri district of Maharastra. *Ethnobotany* 2004; 16: 131-35.
- [154] Nautiyal S, Maikhuri RK, Rao KS, Saxena KG. Medicinal plant resources in Nanda Devi biosphere reserve in central Himalayas. *J Herbs Spices Medic Plants* 2001; 8: 47 - 64.
- [155] Pal DC. Plants used in treatment of cattle and birds among tribals of eastern India. In: Jain SK, Ed. *Glimpses of Indian Ethnobotany*. New Delhi; Oxford and IBH Publishing Co. 1981; 245 - 57.
- [156] Pires TCSP, Dias MI, Calhelha RC, *et al*. Bioactive properties of *Tabebuia impetiginosa*-based phytopreparations and phytoformulations: a comparison between extracts and dietary supplements. *Molecules* 2015; 20: 22863 - 71.
- [157] Sundarsanam G, Reddy MB, Nagaraju N. Veterinary crude drugs in Rayalaseema, Andhra Pradesh, India. *Int J Pharmacogon* 1995; 33: 52 - 60.
- [158] Gupta M, Mazumder UK, Manikandan L, Bhattacharya S, Halder PK, Roy S. Antibacterial activity of *Terminalia pallida*. *Fitoterapia* 2002; 73(2): 165-67.
- [159] Jariæ S, Mitroviæ M, Pavloviæ P. Review of ethnobotanical, phytochemical, and pharmacological study of *Thymus serpyllum* L. *Evidence Based Complement Altern Med* 2015; 2015: 01-10.
- [160] Reddy KR, Sudarsanam G. Plants used as Veterinary medicine in Chittoor district of Andhra Pradesh, India. *Intern J Crude Drug Res* 1987; 25(3): 145-52.
- [161] Vlaisavljevic S, Kaurinovic B, Popovic M, *et al*. *Trifolium pratense* L. as a potential natural antioxidant. *Molecules* 2014; 19: 713-25.

- [162] Oran S, Sahin S, Sahinturk P, Ozturk S, Demir C. Antioxidant and antimicrobial potential and HPTLC analysis of Stictic and Usnic acids of three Usnea species from Uludag mountain (Bursa, Turkey). *Iranian J Pharmaceut Res* 2016; 15(2): 527-35.
- [163] Kemper KJ. Cranberry (*Vaccinium macrocarpon*). The Longwood herbal task force, 1999. Available from: <http://www.mcp.edu/herbal/default.htm>.
- [164] Turker AU, Camper ND. Biological activity of common mullein, a medicinal plant. *J Ethnopharmacol* 2002; 82: 117-25.
- [165] Mahesh B, Satish S. Antimicrobial activity of some important medicinal plant against plant and human pathogens. *World J Agricultural Sci* 2008; 4 (S): 839-43.
- [166] Ali MR, Billah MM, Hassan MDM, Rahman SM, Dewan MAE. *Enhydra fluctuans* Lour: A Review Research *J Pharm Tech* 2013; 6(9): 927-29.

SUMMARY

Modification of lifestyle at the directed way and use of herb-based medicines may be the two branches of prevention of diseases. Identification of active principle/s from solvent extracted parts of medicinal plants is the contemporary way followed for development of drugs for use them in modern medicine. Chemical synthesis of active principles in the laboratory and marketing of these medicines is the target in that type of research. It is followed in the western countries, as they are not having the plant resources like the countries of the torrid zone of the globe. Various components are developed in various species of plants as a part of the evolutionary outcome of the struggle for their existence. Leave, bark, seed, seed coat, flower, root, pulps *etc.* of different plants are considered as reservoirs of naturally occurring chemical compounds and of structurally diverse bioactive molecules. As the plants are engaged in various physiological functioning at living state, so availability of number and quantity of such components in the freshly collected succulent plant parts should be far more than the dried and stored one.

Reported efficacy of the medicinal plants may be validated also through the extracts of the succulent parts like the dry parts. For getting medicines to fight against the diseases of infectious origin, study of antimicrobial, anti-oxidant, immune-modulation and other systemic and local effects may be performed on the succulent extracts also. The same procedures of identification of phyto-chemicals, purification, structure elucidation and biochemical characterization of purified/ semi-purified compounds by toxicity study, *in vivo* study, clinical trials of different phases used before marketing of any synthetic drug may be modified for these succulent bio-medicines also.

A total of 48 plants are listed for easy development of proposed succulent bio-medicines from them as these are used as nutraceuticals, spices or used by many people. Another 1143 plants are listed for their possible effect against the diseases of infective origin, as per available reports.

The cut pieces of the plant parts may be used as medicines of different herbivorous animals. The juices may be used as a new type of medicine for human being as well as for animals. These juices may be concentrated/ diluted as per requirement.

For storage and transportation, use of any chemical preservative may be avoided. Uncontaminated collection and different modern techniques may be adopted to make and keep these medicines germ free. Different nontoxic capsular materials may be used to contain individual doses. Cold chain-based transportation to various countries up to the patient level may be adopted for global commercialization of these medicines.

India can take the leading role of production of such bio – medicines through mass cultivation, extraction, packaging and supply to all parts of the globe. This can also create a good number of small-scale industries in India.



Dr, Shibabrata Pattanayak, B.V.Sc. & A.H.; M.V.Sc. (Immunology); P.G.D.R.D.; Ph. D. (Pharmacology) is working for development of one alternative healthcare system by excluding intake and use of synthetic and toxic chemicals and following of a designed lifestyle along with use of unaltered herbs directly as medicine. Use of extracts and cut pieces of parts of succulent medicinal plants for prevention and cure of diseases after their proper validation of efficacy is the main theme of his research. He has published 25 research and review articles and more than 50 popular science articles on that subject so far. The publications attracted attention of many researchers throughout the globe. Dr. Pattanayak presently ranked above 92% of the global researchers enlisted under Research Gate as per their calculation of Total Research Interest. The present book is a summary of his concept and is offered to all the researchers of all countries of the world with an invitation to develop medicines of that unique type for benefit of the human race.